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A Lecture
ON
PERICARDITIS IN CHILDHOOD.

BY

F. JOHN POYNTON, M.D., F.R.C.P.Lond.,

PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL AND THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND STREET.

In this lecture I intend to pay particular attention to the non-rheumatic forms of pericarditis, although rheumatic pericarditis must also be taken into consideration because it is the pivot of so much of our knowledge of pericardial affections in the young; it is the most frequent in its occurrence, and for this reason the most thoroughly investigated. No attempt will be made to give an exhaustive account of the subject of pericarditis, but I will try to give some personal experiences of the difficulties and dangers in which one may become involved.

There can be no doubt that all forms of pericarditis are serious, though we may occasionally meet with a rheumatic case which runs a very favourable course, producing no degree of distress and leaving no appreciable damage. Such cases are rare, for it is unusual for rheumatism to cause pericarditis as a solitary fleeting lesion of the heart.

Suppurative pericarditis is a very fatal disease, and tuberculous pericarditis with its formidable complications has a gloomy outlook. When suppurative pericarditis occurs in association with osteomyelitis it is usually staphylococcal in origin, and it has been my unfortunate experience to find it then but one factor in a general septicaemia for which any local treatment has been futile.

The outlook is more favourable in cases of pneumococcal origin, and we win an occasional triumph with the assistance of skilled surgery and excellent nursing. We may be inclined to wonder why the danger is so great in pneumococcal pericarditis, for empyemata, though serious enough, are repeatedly treated with great success, and we do not as a rule see in pneumococcal pericarditis that great cardiac dilatation we meet with in the severe rheumatic form, and the cardiac valves are usually unaffected. There are, however, some good reasons for this. One is the very early age at which pneumococcal pericarditis most frequently occurs. In an analysis of 100 fatal cases of suppurative pericarditis of all varieties I found that 84 per cent. of the patients were under 4 years of age. Another is the rarity of this form of pericarditis as a solitary event. I found only one such case in this series, and have seen one other; 54 were associated with empyemata and 31 with pleurisy or pneumonia. When treating pneumococcal pericarditis, then, we are almost invariably dealing with it as a complication of already serious disease.

There is still another reason due to the difficulties in the diagnosis which leads to delay or actual oversight of the condition. One great cause of difficulty is the frequent absence of pericardial friction. Thus it was only recorded in two cases in the series I analysed, and though it is more likely to be detected in adults and in the older children, it is in my experience usually, even in the latter, soft and evanescent. It is difficult to realize how much we depend upon pericardial friction in the diagnosis of pericarditis—almost as difficult as to realize how much we rely upon coal until we have none. Then, again, there is always difficulty in making a diagnosis of a new event in an illness where already the first event has been a grave one. An empyema takes up much of our attention, and when progress is arrested we naturally and reasonably expect to find the explanation connected with the original trouble, and look for imperfect drainage or loculation of the abscess, or suspect some tuberculous infection to be complicating the suppurative process.

Again, in a very young child the symptoms of suppurative pericarditis are not distinctive. Sudden sharp rises of temperature, sudden attacks of dyspnoea and cyanosis, and sudden death have been recorded, but many cases have never been even suspected during life. Lastly, these cases are comparatively infrequent, and we have time to forget the lesson we have learnt from a previous failure, by the time the next case presents itself.

Diagnosis.

The diagnosis of suppurative pericarditis is naturally much easier when there is pericardial friction, but it is very possible to miss this evanescent sign or not to appreciate its value. The development of a definite effusion is our great assistance in diagnosis when there has been no friction. In medical textbooks you find the signs of pericardial effusion clearly stated, and here I shall only touch upon certain points which have attracted my attention.

The diagnostic signs to which I attach most importance are the gradual disappearance of the heart sounds step by step with an increase in the area of precordial dullness. Unfortunately we may not see the patient in the early stage or the notes of that stage may be deficient or inaccurate, and if this is the case there may be doubt whether the faintness of the sounds is not the result of severe cardiac dilatation or great thickening of the pericardium. The outline of the precordial dullness requires careful mapping out, and we may be struck by its wooden character if the effusion is considerable. A noticeable feature in pericardial effusion is the upward extension of the dull area, sometimes on both sides, but particularly on the left. This upward extension compresses the upper lobe of the left lung, with the result that you may find impairment of the percussion note over the left clavicle, below this tubular breathing from the pulmonary collapse, and below this again the wooden dullness of the pericardial effusion. Nevertheless, these signs may be puzzling, for we have to remember to take into account the possibility of pneumonia in the left upper lobe, or, again, we may know that there is an empyema on the left side, and this may have already been opened. When this is the case, as you know, the physical signs in the chest, quite apart from any pericardial effusion, are apt to be difficult.

The dull area due to pericardial effusion may extend far beyond the apex beat into the left axilla, and then you find yourself wondering whether this dullness is entirely due to the fluid in the pericardium, or whether there is in addition a left pleural effusion. During the war I had a young soldier under my care with a tuberculous effusion in the left pleura, which I tapped. This was followed by a large pericardial effusion, which in turn was drained, and then for some months, at intervals, I drew off fluid from his chest by paracentesis in the left posterior axillary line. I thought I was emptying a recurrent pleural effusion, but when he eventually succumbed I found his left pleura was firmly adherent, and that I had been in reality tapping the pericardium. I mention this case to remind you how extensive a pericardial effusion may become when it persistently recurs.

On the right side the precordial dullness may reach the nipple line, and, as you are aware, the direction of this right line extends from above downward and outward, forming with the horizontal upper limit of the hepatic dullness an obtuse angle opening outward. On the other hand, when the heart is dilated and there is no effusion, the outline of the dilated right auricle is generally curved, and forms with the hepatic line an acute angle. When there is extreme dilatation, particularly when in addition there is an adherent, thickened pericardium, this distinction unfortunately does not hold.

This precordial dullness reaching to the right of the sternum needs as much consideration as that on the left side. It may be the result not of a pericardial effusion, but of a pleural effusion on the left side displacing the heart, or it may be due to a collection of fluid between the right lung and pericardium, and a recent case will illustrate the kind of problem I am now considering.

A girl of 8 years was admitted with the signs of a large effusion in the left chest and a precordial dullness extending to the right nipple line. This was apparently explained by the collection in the left pleura, which proved to be an empyema. Two pints of pus were evacuated, but the child after a brief interval of improvement began to go downhill, and one morning I heard a suspicion of pericardial friction, and found the precordial dullness once more extending to the right nipple. Seeing how freely the empyema had drained, why was this? I was forced to conclude that it was the result of a pericardial effusion, and Mr. Addison explored the pericardium for me and discovered a haemorrhagic exudation. This was, however, unfortunately not the whole explanation, for there was also an overlooked empyema at the root of the right lung.

You will be expecting the mention of radiographic

investigation. It is of great value in these cases, but I have not had a good reason for hurrying to it. Every year the opportunities for radiography are growing, but it is quite possible you may not be within reach of a radiographer, for these cases are very acutely ill. Even if he is at hand I am sure that the use of the rays ought never to replace minute clinical examination, for you want in these difficult cases every atom of evidence you can collect. Without any intention of laying down the law, I would venture to say that the use of this method tends to make us neglectful of minute clinical examination, a danger also illustrated in the diagnosis of thoracic aneurysm. I would remind you that the difficulties in the interpretation of *x*-ray shadows may be as great as those of the clinician, and carry with them this additional danger, that they are apt to resolve themselves into a dogmatic "yes" or "no" when it is really impossible to make so definite a decision. You must not expect the radiographer to be intimately acquainted with all the intricacies that surround the diagnosis of a pericardial effusion, and he must, however skilled, always be giving you an opinion upon shadows. I doubt, indeed, if it is possible to distinguish by radiography between a pericardial effusion and a dilated heart with a greatly thickened and adherent pericardium; personally I cannot do so, though I realize that the indications for treatment are very different in those two conditions. If you can distinguish the darker shadow of the heart's outline surrounded by a somewhat lighter zone bounded by the pericardium you are a distinct step forward.

There are some very interesting physical signs at the back of the chest in some cases of pericardial effusion—signs which are also met with when there is great cardiac dilatation, and particularly obvious when, as in acute rheumatic pericarditis, both factors are present. In children these signs are very striking. A patch of intense tubular breathing appears to the left of the spine about the level of the inferior angle of the scapula—below it the breath sounds, though diminished, may be natural and above it they are unaltered. Later the note becomes dull on percussion even to the base, and the area of tubular breathing expands downward, but over this area there may be no adventitious sounds. As the pericardial effusion subsides and the heart becomes less dilated the note improves, the breath sounds become first puerile and finally vesicular again, but the area of intense tubular breathing in the region of the angle of the scapula is the last to disappear.

Two mistakes may be made if you are not acquainted with this phenomenon, of which I have seen most striking examples: you may diagnose pneumonia or a pleural effusion. The condition is, however, one of pulmonary collapse, and is due to the cardiac lesion and not to a secondary pulmonary or pleural infection. Nevertheless, these are such involved cases that I advise you to weigh the evidence for each patient, as it is quite possible that there may be a concurrent pneumonia or pleurisy in any particular case. The area of intense tubular breathing at the level of the angle of the scapula is a very suggestive sign of the cardiac origin of the pulmonary signs when combined with a faint vesicular murmur below this level and the absence of any moist sounds.

Obliteration of the left intercostal spaces in the left precordial region and a wavy impulse over several spaces and absence of diaphragmatic movement may each have their value in the diagnosis. You will notice the rapid short respiration and abrupt cough and pay great attention to the pulse. A small, almost imperceptible, wave is a warning of an embarrassing effusion.

The diagnosis of pericardial effusion once made, the next step is to decide upon the cause. This is often obvious but sometimes difficult. In exceptional cases of pneumococcal origin with loud friction rheumatism may be diagnosed, but it is tuberculous pericarditis, on account of its rarity, that is most likely to deceive us. A blood-stained effusion in a child is not usually tuberculous or malignant in nature, for the most frequent cause is acute rheumatism.

Tuberculous pericardial affections are most interesting and perplexing. There may be friction and no effusion. There may be extensive and recurrent effusions without friction, and there may be recurrent forms with recurrent friction, ending in that rare but definite disease called multiple serositis. The course of multiple serositis in a child is this: you first meet with the case as one of pleurisy and pericarditis, and may believe it to be rheumatic, although you are surprised by the absence of other rheumatic symptoms or of a previous history of rheumatism or of any valvular lesion, although this latter may be present in tuberculous heart disease. The case drags on month after month, and I have watched one for three and another for two years, the children coming under notice at one time for a fresh attack of pleurisy, at another for fresh pericarditis. Gradually you find the liver enlarging, the spleen becoming palpable, and ascites developing. The heart sounds are now muffled and the precordial dullness is wooden, and there may be clear signs of pericardial adhesion. The ascites may be tapped time after time, but invariably recurs, and the child gradually loses ground. Finally there are convulsions, or ocular palsies, with a rise of temperature and death in coma. The necropsy shows adherent pleurae, an adherent greatly thickened pericardium strangling the heart, an enormous nutmeg liver, ascites, and tuberculous meningitis.

Treatment.

The treatment of pericarditis with effusion is always difficult. The first question is, Ought we to use surgical measures? The second, What surgical measures should we use? The third, How should we apply them?

In the pneumococcal cases we feel sure we ought to liberate the pus. Ought we to drain the rheumatic cases, which are also infective, early in their development?

The answer seems to me to be involved in these considerations. The rheumatic infection is apparently destroyed by the tissues more effectually than the pus-forming organisms. There seems to me also to be this difference in their toxins. The pus-forming infections destroy the cells and survive in the fluid; but the rheumatic organism, though it may often lie dormant in necrotic tissue, is less destructive, and is difficult to find in any numbers in a fluid containing phagocytic cells which, though damaged, are many of them not destroyed. The poisons are of a different nature, and not, in my opinion, merely attenuated suppurative infections.

Thus it is we find that in the rheumatic pericarditis the process generally subsides, leaving, however, behind it traces of its destructive nature. The pneumococcal and other suppurative infections may also quiet down in very exceptional cases of slight severity, but far more frequently they tend to remain active, sometimes acutely so and sometimes with diminished intensity. We must remember, also, that the infection commences within the pericardial tissues, and that drainage of the sac can only remove the bacteria and toxins present in its cavity.

I have seen several rheumatic cases opened in the early stage of pericarditis and a certain amount of fluid removed, but the course of the case has not, as a result, been perceptibly altered for the better, and there is a distinct risk involved in such an operation. Our need in rheumatic heart disease is clear enough: we want a serum which would give that assistance to Nature which would enable the tissues to overcome the infection more rapidly and more completely than at present—a service that salicylate of soda, in my opinion, has failed to give us.

Moreover, we can never afford to lose sight of the cardiac dilatation which occurs in rheumatic pericarditis. I never study such a case without attributing the great enlargement of the precordial dullness first to dilatation. When I am convinced that this explanation is not sufficient I still keep before me the element of dilatation, and when the history points to previous heart infection, recall the fact that a dilated heart with an added pericardial effusion and a dilated heart with a much thickened pericardium are almost indistinguishable.

Yet in spite of this caution, the result of repeated observation, I am guilty of being the inciter of an exploration in which the heart was pierced in three different places! When I tell you that I have seen dilated rheumatic hearts with small aneurysmal projections in the right ventricle due to the visceral pericardium being the only barrier between the blood in its cavity and the pericardial sac, you may well ask me what was the result of this adventure. As so often happens to the wicked in this world, the result was astonishingly successful, for this almost moribund child from that moment commenced to mend, and left the hospital in fair case. I have, however, no intention of

repeating that mistake, and this I can tell you with absolute confidence, that paracentesis of the pericardium in rheumatic pericarditis under 12 years of age is rarely called for. I would venture to impress this general rule upon you as the result of experience—move slowly to paracentesis in rheumatic pericarditis.

The next question, having decided that an effusion should be surgically treated, is, What method should we employ? We have two alternatives. We can explore with a trocar and cannula, or we can open the pericardium. For a decision on this question we need all our judgement, which will be based upon a complete review of the case. A rheumatic effusion is often sero-fibrinous and difficult to drain through a cannula. A purulent effusion requires ample drainage, but a serous tuberculous effusion flows easily through a cannula. Another point for consideration is that of anaesthesia. Upon this I can say from my experience that though these children are desperately ill, I have been much encouraged by the ease with which a skilled anaesthetist has managed them. There must be a risk, but I have never yet seen any mishap even in the worst cases.

As a general rule, I prefer to use drainage of the pericardium rather than to trust to paracentesis, and aim at making the diagnosis sufficiently sure to justify immediate recourse to opening the pericardium. Individual cases in which there is good reason to believe the fluid is serous, or in which immediate relief by the simplest method is urgent, will be excepted from such a general rule.

Lastly, there is the method of exploration of the pericardium. There are various routes, and all things being equal, that by which the most effective drainage can be obtained is the best. The one I prefer, and the one my colleague Mr. Addison has chosen, is the abdominal route—in French literature often termed Marfan's route. In paracentesis the procedure is to define the tip of the ensiform cartilage, and introduce the needle immediately below the tip for some three-quarters of an inch, then to direct it upward, grazing the under surface, and lastly slightly backward, entering the pericardium through the base. When opening the pericardium the ensiform is removed and the pericardium incised from below. This route is not indicated when there is deformity of the thorax or considerable abdominal distension, but I have not met as yet with these contingencies. In such a case the incision to the left of the sternum, avoiding the internal mammary artery and resecting costal cartilages, is the alternative.

I can give precise information as to the result of drainage by the abdominal route, for in a recent case, after the left pleura and pericardium had been drained, death resulted from an overlooked right empyema that lay deep near the root of the lung. The necropsy showed that the pericardium was perfectly drained and rapidly becoming adherent.

There may be some after-difficulty with the drainage, but in my own cases this has generally been easily overcome. The great dangers are the high degree of toxaemia due to the disease, with the consequent tax on the child's vitality, and the liability in these cases for other suppurative lesions to be present or to develop later; for example, the overlooked right empyema in the case I have just mentioned, or a suppurative meningitis, which may be very deceitful in its latency, but which is invariably fatal in such a condition; or, again, a suppurative peritonitis.

The use of an autogenous vaccine is clearly indicated where progress is slow but drainage satisfactory.

Reverting now to rheumatic pericarditis, I would direct attention to a peculiarly malignant type which I have seen on more than one occasion in young children since the war. These are cases with a very gradual onset and with little or no fever, in which the heart has stealthily developed extreme disease. Endocarditis appears first, with dilatation, and then, sometimes after weeks, pericarditis, which may be haemorrhagic, is detected. Usually small subcutaneous nodules appear, and throughout the child has no pain, but lies quiet and taciturn, reacting to no remedies. I cannot help feeling that it is some result of the poor food during war-time which has weakened the tissue resistance, and, rightly or wrongly, I associate this feebleness with the prevalence of grave anaemias in childhood, of which I have seen of late frequent and most distressing examples.

I also wish to direct attention in rheumatic pericarditis to signs of pleuro-pericarditis and to very superficial crepitations immediately under the sternum and in its neighbourhood, the result of a concurrent mediastinitis. These are indications which will lead you to expect the formation of extensive external pericardial adhesions, which, as you know, are the great factors in the development of serious trouble from an adherent pericardium. The heart, dilated and weakened by the rheumatic poisons, is tethered to the surrounding structures by these adhesions. Compensation, then, is never effectual, and a prolonged history of gradual failure will be the outcome.

If a child previous to an attack of pericarditis has already an aortic lesion you may find that signs of angina develop, and the outlook then is very grave. In a few exceptional cases thrombosis of the large veins in the neck may occur, and you must suspect this complication when when one or other arm suddenly becomes oedematous. I have seen the superior vena cava with all its great branches obliterated by such a thrombosis and death occur from pulmonary infarction.

I have already mentioned several times great thickening of the pericardium, and I would compare the process to that which occurs in mitral stenosis. You suspect it when the pericarditis is subacute, but continually recurring at intervals which may extend over many weeks. Nodules may form in the pericardial tissues, and the heart becomes greatly dilated. You can readily understand that paracentesis or exploration must be a failure and a danger, and unless you have actually seen such a case explored you can hardly realize the difficulty the surgeon will have in locating his path. It is quite easy to burrow into the mediastinal tissues by the thoracic route and never to enter the parietal pericardium at all, and even if you do with a trocar you will very easily find yourself in the cavity of the right ventricle. It was for an adherent pericardium due to multiple serositis that Mr. Trotter did for me the first published case of Brauer's operation in this country, although Mr. Thorburn had previously undertaken a like operation. This operation consists in stripping an area of the chest wall off the adherent pericardium, and is an alarming undertaking. The indications that the cardiac failure is due to the adhesions must be very clear to justify it; in my case three years of comfortable life resulted. Previous to the operation the boy could not walk down the ward and rapidly developed oedema in the erect position.

In this case, when the ribs were freed from the apical region, it was remarkable to see the heart jump back as if it had been held by a spring. There was no valvular disease, and the tough adhesions were chiefly located to this apical region. It was, as you can understand, a very favourable and very unusual case, and the patient would have done very well indeed had it not been tuberculous in origin, and that later tuberculous pleurisy developed and recurred. This embarrassed his respiratory system, and eventually caused heart failure. For two years this boy, who had been unable to walk down the ward, was able to act as cricket scorer to his club. I have never had a rheumatic case in which I could find the courage to advise this operation, though others have had successful ones. The presence of valvular disease, and the possible disaster that might occur if the diagnosis was incorrect, are formidable deterrents.

In one case of rheumatic serositis I have seen the Talma-Morrison operation done for the recurrent ascites, but it was a failure.

The medical treatment of rheumatic pericarditis has not altered in recent years; there are still some who believe that sodium salicylate is a specific, and others who do not. Which side be right, I cannot say that I am much impressed by the efficacy of our treatment. We are waiting for further researches to discover some specific serum or other biochemical therapy. You must all have been struck from time to time with the remarkable recoveries that result occasionally from serum and vaccine therapy in acute streptococcal infections; we wait in hope for such a result with the rheumatic. In the meantime, Sir William Gull's warning remains as true to day as when he gave it: not to persecute the child with over-treatment.

The indications and the remedies in vogue are plainly stated in handbooks on diseases of childhood, and I need not detain you with a recapitulation of them. It is essential to remember that it is not sufficient for the

symptoms to subside, we have to wait also for the recovery of the damaged cardiac muscle and adaptation of the heart to the valvular lesions which are almost invariable in the rheumatic form of pericarditis. Six months spent in nursing the heart back to efficiency is a very small part of a lifetime, and you cannot go far wrong if you make each forward step a test, guided by the pulse, the apex beat, the cardiac outline, the temperature, and, above all, the general condition of the child.

In conclusion, though I realize you already know much that I have commented upon, this lecture may help to recall to you that in the treatment of pericarditis in childhood we must be prepared to display all our clinical knowledge and that balance of judgement which it is so difficult to keep when pressed by urgent illness, complicated conditions. anxious parents, and possibly divergent opinions

A Study
OF
SOME FACTORS CONTROLLING THE NORMAL SUGAR CONTENT OF THE BLOOD.

BY

P. J. CAMMIDGE, M.D.Lond., J. A. CAIRNS FORSYTH, F.R.C.S.Eng., AND H. A. H. HOWARD, B.Sc.Lond.

Accurate knowledge of the mechanism by which the sugar content of the blood is normally maintained and controlled is obviously an indispensable preliminary for a correct interpretation of the means by which hyperglycaemia and glycosuria may be produced. When, therefore, we found it impossible to explain satisfactorily on current theories many of the phenomena we observed in the course of an experimental investigation of diabetes mellitus to which we had been led by previous work upon the changes in carbohydrate content of the blood associated with pancreatic disease, it became necessary to study the subject afresh. The experimental part of the work was commenced in 1919, and reference has been made to some of the results in a previous paper,[1] but we now propose to discuss the subject in greater detail.

Before doing so it will be advisable to deal briefly with the methods of analysis adopted, for the discrepancies between the figures quoted by different observers are no doubt to be explained to some extent by the various processes for estimating the carbohydrate content of the blood employed. Many of the older findings were obtained with methods which do not completely remove all traces of protein, and are therefore of little value, but even in some of the more modern processes, such as Benedict's picric acid method, where this is successfully accomplished reducing substances other than sugar are included in the determination. After much preliminary experiment to discover a method of analysis which would give a reliable estimate of the reducing sugar, and that alone, we adopted in the first place a modification of the process described by one of us in 1917.[2]

In this the proteins are removed by filtration after they have been precipitated by heating with sodium chloride and dilute acetic acid. The reducing power of an aliquot part of the filtrate is then determined by boiling with a solution containing copper sulphate, sodium carbonate, and potassium citrate, converting the cuprous oxide formed into cuprous chloride by adding hydrochloric acid and then estimating the cuprous chloride with standard iodine and sodium thiosulphate solutions, using starch as the indicator.

Later, we more frequently employed a modification of the process described by Folin and Wu,[3] as a considerable saving of time is effected when a large number of estimations have to be made, as was often necessary.

In the Folin and Wu method the proteins are precipitated with a solution of sodium tungstate and dilute sulphuric acid; an aliquot part of the filtrate is heated with an alkaline copper solution and the reduced copper dissolved in an acid mixture containing sodium molybdate and sodium tungstate. This solution is then made alkaline with sodium carbonate, diluted to a fixed volume, and the depth of the resulting blue colour compared in a colorimeter with that given by a standard solution of pure dextrose treated in the same way.

Although these methods differ in principle, numerous control experiments with sugars, and many simultaneous estimations of the sugar content of normal and pathological bloods, have shown that they give results which correspond within the limits of experimental error, the variation being not more than 0.002 per cent. either way in experienced hands. It is therefore probable that they give as accurate a determination as is possible of the proportion of reducing carbohydrate. Since our investigations of the blood were carried out at hourly, or in some instances at half-hourly, intervals for several hours, and sometimes throughout the whole day, it was necessary that we should work with as small an amount of material as possible and obtain it with a minimum of discomfort, to avoid the effects of nervous disturbance and fatigue; we therefore employed as a rule 0.3 c.cm., taken from the root of the nail in the human subject and from the marginal vein of the ear in animals. This amount was drawn into an accurately calibrated narrow pipette, direct from the puncture made by a sharp needle, without the use of oxalates or other anticoagulating substances.

It is now recognized that the percentage of sugar present in the blood is not a fixed quantity, even in health, but varies within limits which are, however, confined to a comparatively narrow range. As the most important factor influencing the proportion of sugar in the blood at any particular time is the ingestion of food, it follows that, to obtain comparable results, the blood must be taken after a fast of sufficient duration to eliminate the direct action of food, or that the effects of test diets of known composition should be studied.

To consider first the figures obtained after fasting. We have found that in fifty human beings from whom samples of blood were taken in the morning, twelve to sixteen hours after the last meal, the sugar content of the blood averaged 0.085 per cent., with extremes of 0.070 per cent. and 0.102 per cent., but that nearly half (44 per cent.) gave a fasting level of 0.080 per cent. or 0.082 per cent. This agrees with the results obtained by Rona and Döblin,[4] who found an average of 0.080 per cent. in ten individuals, with extremes of 0.048 per cent. and 0.128 per cent. by the polariscopic method. In the carnivorous dog our average fasting level for eight animals was 0.083 per cent., with extremes of 0.074 per cent. and 0.090 per cent., which corresponds closely to Oppler and Rona's polariscopic average of 0.085 per cent. for four animals, their extremes being 0.073 per cent. and 0.102 per cent. The average fasting value for twenty-five rabbits, which we took as examples of herbivorous animals, worked out at 0.083 per cent., the extremes being 0.080 per cent. and 0.096 per cent. These figures are lower than were obtained by Oppler and Rona and most other observers, but agree with the more recent values quoted by Jones, working with MacLean's micro-method,[5] who found an average of 0.086 per cent. in sixteen rabbits, the highest being 0.116 per cent. and the lowest 0.068 per cent. The great difference in the blood sugar values found in rabbits by many experimenters is probably due to the fact that they are peculiarly liable to emotional disturbances which raise the percentage of sugar in the blood. The fasting value for cats is usually stated to be very high. Lyttgens and Sandgren[6] give 0.291 per cent., and Oppler and Rona an average of 0.280 per cent. for four estimations, with extremes of 0.154 per cent. and 0.354 per cent., but a sample of blood we obtained from a small accidental cut on the paw of a fasting cat showed a blood sugar content of 0.094 per cent., a figure which corresponds more nearly to the average values for other mammals, and agrees fairly closely with the value of 0.088 per cent. quoted by Pavy[7] as given by the heart blood of a cat killed by pithing. The higher figures for cats, like those quoted for rabbits, are probably to be attributed to emotional excitement.

Although we have found that the same person, or animal, does not invariably give exactly the same fasting value, the length of the fast does not appear to exert any material influence on the proportion of sugar in the peripheral blood, judging from our experience with rabbits which we have examined after twelve to seventy-two hours' abstinence from food. Allen[8] has come to the same conclusion, and states that "approximately the normal percentage is stubbornly maintained through prolonged starvation, almost up to death." It would therefore seem that, when the digestive apparatus is functionally inactive, the sugar content of the blood is kept at an almost constant level for the same individual, and only varies within very narrow limits for different mammals, irrespective of their usual diet.

Turning now to the effects of food on the sugar content of the blood, we find that the rise in the percentage of sugar associated with functional activity of the digestive apparatus follows a curve which ranges within well-defined limits that appear to be practically identical for all

mammals under similar conditions; the shape of the curve is also of a similar type for omnivorous, carnivorous, and herbivorous animals. Since Jacobson[9] published his observations on the normal sugar values of the blood and their physiological variations, in 1914, it has been known that the effects produced by food vary to some extent with its composition. According to Jacobson, sugar taken by the mouth causes the most rapid rise in the percentage of sugar in the blood, with starch a comparable though slower increase occurs, but with proteins and fat there is no appreciable change. Our observations confirm his conclusions as regards sugar and starch, but we cannot agree with the statement that protein foods have no appreciable effect on the sugar content of the blood.

As the charts (Figs. 1 and 2) show, dextrose and laevulose taken by the mouth produced in both human beings and dogs a rapid rise in the blood sugar, which reached its maximum at the end of an hour, and during the next hour there was an equally rapid fall, so that the normal fasting level was regained. Starch, whether in the form of bread taken by man or a dog, or of oats given to rabbits, produced a slower increase, which did not reach its maximum until the second or third hour, and was equally slow in subsiding (Figs. 3, 4, 5). Although our observations show that a purely protein meal, in the shape of 6 ounces of boiled haddock containing 40 grams of protein, did not raise the sugar content of the blood as rapidly or to as high a level as 100 grams of bread containing 54 grams of carbohydrate, there was an unmistakable rise, which reached its maximum at the fourth hour in man (Fig. 3), while 4 ounces of lean meat taken by a dog gave the same maximum percentage of sugar as a mixed meal of bread, dog biscuit, meat, bones, and an ounce of marmalade, but the increase did not take place as rapidly as with the mixed diet (Fig. 4).

In order to study the effects of fat, an ounce of olive oil was taken fasting by one of us, and on the two following days test meals of bread-and-butter and of sardines were given to the same subject. The meal of plain oil was followed by a very slight rise in the sugar content of the blood at the first hour (Fig. 3), then by a slow and steady fall in the next two hours, after which it returned to the fasting level again. The addition of fat, in the shape of butter, to bread was found to retard the rise and prolong the fall in the percentage of sugar in the blood, so that the maximum level was not reached until the third hour, instead of at the second, as when the same amount of bread was taken alone and the maximum was also a little lower. Similar results were obtained with normal dogs. A meal of protein and fat in the form of sardines gave results which differed in much the same way from those obtained when a fat-free protein was taken (Fig. 3).

It is therefore clear that sugars, starches, and proteins all increase the sugar content of the blood in animals and man, but that the rate at which the increase takes place, and the extent of the rise above the fasting level, vary with the nature of the material, pure sugars producing the most rapid rise and fall, then starch, and then pure protein; fat, on the other hand, tends to depress the level of the blood sugar when taken alone or with another food, either carbohydrate or protein. On comparing the effects of mixed meals consisting of oatmeal porridge, eggs, bread-and-butter, marmalade, sugar, milk, and tea in man (Fig. 3), and bread, dog biscuit, meat, bones, and marmalade in the case of a dog (Fig. 4), with oats, cabbage, carrot, for a rabbit (Fig. 5), it will be seen that the form and range of the blood sugar curves are remarkably constant, reaching their maximum point at the third hour, and returning to the fasting level again about the fifth or sixth hour. The slightly higher level attained in man than in the dog, and in the rabbit than in man, is possibly related to the amount of fat contained in their respective diets, although there may be a constant difference of this degree in the upper blood sugar limit characteristic of the species, for in each case the maximum on a mixed diet and on simple foods was approximately the same.

From these results it is evident that (1) the fasting level of the blood sugar is remarkably constant, and is not related to the habitual diet; (2) the time and space relations of the variations in the sugar content following the ingestion of food are also strikingly similar in herbivorous, carnivorous, and omnivorous animals; (3) while carbohydrate foods induce the greatest excursion above the fasting level, the effect of a purely protein meal is little if any less, but that fat causes a very slight increase, and has a delaying action and depressing effect on the rise which would otherwise occur with carbohydrates and proteins; (4) the upper limit attained by the blood sugar after a meal is apparently not directly dependent upon the amount of food taken after a certain minimum has been consumed.

Any theory, therefore, regarding the mechanism by which the sugar content of the blood is controlled must account for all of these facts, and also be capable of explaining how hyperglycaemia may occur under pathological conditions. It has been very generally assumed that the increase in the percentage of sugar in the blood following a meal is due to the direct passage into the peripheral circulation of sugar derived from the food. If it were true that such an increase only follows the ingestion of sugar or starch, this might be accepted as a possible explanation, although even then it would be difficult to account for the remarkably constant maximum level produced by different carbohydrates and varying quantities of the same starch or sugar; but as a purely protein meal causes a similar rise, which may attain the same maximum as after a carbohydrate meal (Fig. 4), the true explanation is probably not so simple.

It may, of course, be contended that sugar can be formed from protein in the body; but it seems unlikely that it would appear in the circulation almost as rapidly as the sugar produced by the digestion of starches, and one would expect the rise in the sugar and urea of the blood after a protein meal to correspond more closely in point of time than the experiments of Jacobsen and Edwards[10] have shown is the case. Another fact which cannot be explained by the current theory is the distinct reduction of the sugar content of the blood following the ingestion of oil. The delay in the sugar curve produced by the addition of fat to either carbohydrate or protein might be accounted for by more prolonged gastric digestion, but this would not explain the effect of fat taken alone.

When we were investigating the blood changes produced by solutions of various amounts of sugar we carried out a series of controls in which the same fluid without the sugar was taken, and found that a distinct, although much less pronounced, increase in the sugar content of the blood could be produced (Fig. 1). This result led us to investigate the blood changes following "sham feeding," and we found that when a patient was given a meal of "thrice-boiled" vegetables (that is, vegetables of low carbohydrate value which had been boiled in three changes of water to remove practically all the starch and sugar) a blood sugar curve of the same type, but of diminished range, as that induced by a carbohydrate meal was produced.

A pronounced example of this is seen in the diagram (Fig. 6), where the effects of a meal of oatmeal porridge and another of thrice-boiled vegetables are contrasted. It will be noticed that in this case the maximum height of the sugar curve was attained at the end of the first hour in both experiments, instead of at the second or third hour as is usual. Since the patient complained of symptoms suggesting hyperchlorhydria, and analysis of a specimen of stomach contents recovered after an Ewald test meal showed an excess of hydrochloric acid, it seemed possible that the unusually rapid rise in the sugar content of the blood might depend upon this. We accordingly investigated the blood sugar changes in healthy persons following the additions of varying amounts of hydrochloric acid to a similar meal taken on successive days, and found that as the quantity of acid was increased the maximum level of the blood sugar curve was reached more quickly, so that with the addition of 60 minims of dilute hydrochloric acid (*B.P.*) a first-hour instead of a third-hour curve was produced (Fig. 7). At the same time the curve became steeper in its ascent and descent, and also reached a higher level, 60 minims of the acid being followed by a maximum of 0.17 per cent. of sugar and 30 minims by 0.164 per cent., compared with a maximum of 0.152 per cent. when no acid had been taken by the mouth. The converse experiment of taking an alkali with the meal produced the opposite effect, depressing the maximum and prolonging the fall of the curve; 10 grams of bicarbonate of soda, for instance, taken with a meal of the same composition as in the preceding experiments, resulted in a maximum blood sugar of 0.140 per cent.

From these findings it is evident that the space and time relations of the blood sugar curve induced by food, or even the introduction into the stomach of any substance stimulating its physiological activities, are intimately related to the acidity of the gastric contents. The fact that the ingestion of olive oil induces practically no change in the sugar content of the blood, and that fat taken with carbohydrate or protein delays and depresses the rise which would otherwise occur, is in conformity with this conclusion, for it is well known that fat inhibits the flow of acid in the stomach and induces neutralization of the gastric contents by regurgitation of the alkaline duodenal secretions into the stomach.

The question which now arises is, How does the acid produce its effect? The first answer that suggests itself

is that since the speed at which the stomach empties is related to the acidity of its contents, the rapidity with which the sugar derived from the food enters the circulation may also be dependent upon the acidity of the gastric contents. Although this theory would explain the results obtained with starch and sugar, it would not account for the effects produced by sham feeding or of tea without milk or sugar. It seems probable, therefore, that the presence in the duodenum of the acid is itself in some way responsible for the rise in the blood sugar. There are three ways in which this effect might be brought about—(1) by the direct action of the acid upon the liver cells, with consequent glycogenolysis; (2) through the formation of salts, which activate a glycogenolytic ferment in the liver; (3) by the inhibiting of some controlling factor which interferes with the conversion of glycogen into sugar in the fasting state.

Murlin and Sweet[11] have endeavoured to explain the rapid onset of diabetes in depancreatized dogs on the first hypothesis. They maintain that since the hydrochloric acid of the gastric juice cannot in such a condition be completely neutralized owing to the absence of the alkaline

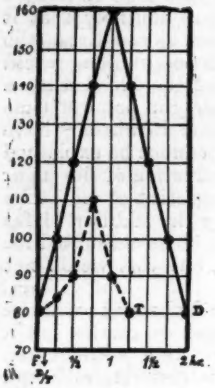


FIG. 1.

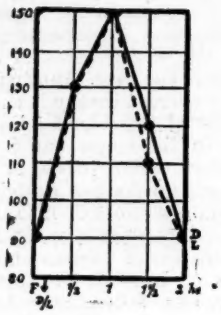


FIG. 2.

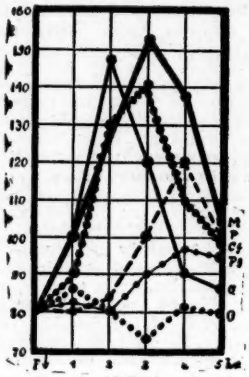
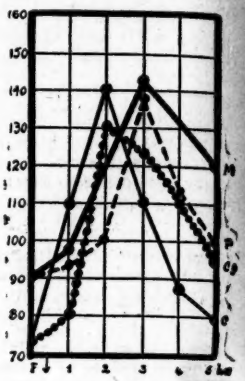


FIG. 3.



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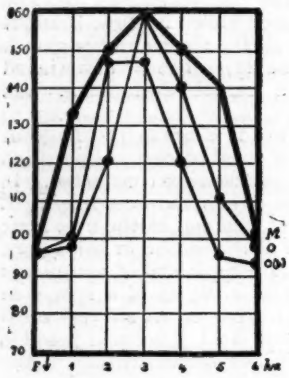

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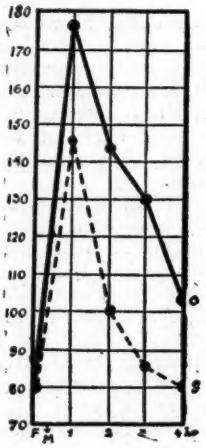

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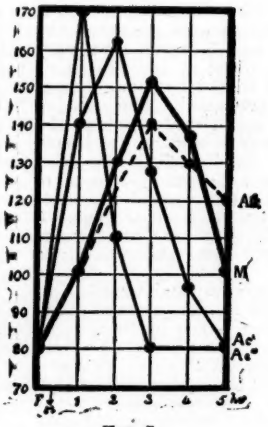

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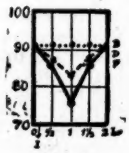

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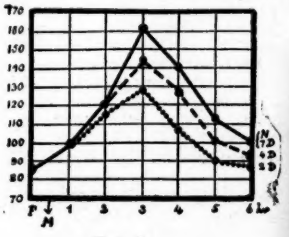

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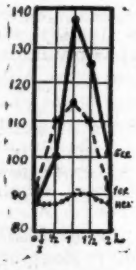
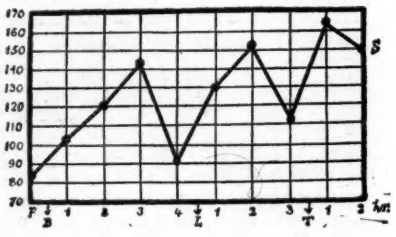


FIG. 10.



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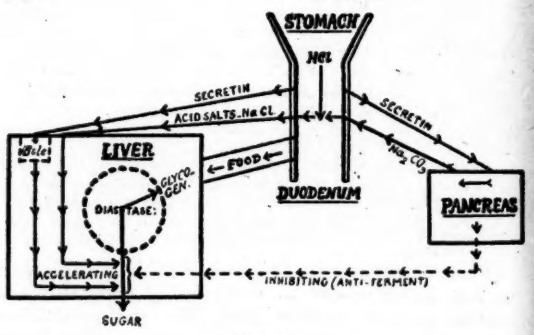

FIG. 12.

FIG. 1.—Blood sugar content following dextrose (D) 100 grams by mouth, and weak tea (T) without milk or sugar, taken fasting.

FIG. 2.—Blood sugar in normal dog following 1.5 grams per kilo of dextrose (D), and 1.5 grams per kilo of laevulose (L) by the mouth, taken fasting.

FIG. 3.—Blood sugar content in man following M, mixed meal; P, protein (haddock); C, starch (bread); O, fat (olive oil); Cf, starch and fat (bread-and-butter); Pf, protein and fat (sardines); F, fasting level.

FIG. 4.—Blood sugar content in a dog following M, mixed meal; P, protein (lean meat); C, starch (bread); Cf, starch and fat (bread and margarine); F, fasting level.

FIG. 5.—Blood sugar content in a rabbit following M, mixed meal; O, dry oats; O(p), oatmeal porridge; F, fasting level.

FIG. 6.—Blood sugar content in man following O, oatmeal porridge; S, sham feeding with "thrice-boiled" vegetables.

FIG. 7.—Blood sugar content in normal man following M, mixed meal; Ac', a similar meal with 30 minims acid. hydrochl.; Ac", a similar meal with 60 minims acid. hydrochl.; Alk, a similar meal with 150 grains sod. bicarb.; F., fasting level.

FIG. 8.—Effects of intravenous injections of pancreas extract on the blood sugar of a fasting rabbit: F, pancreas taken from a fasting rabbit; D, taken three hours after a mixed meal; B, boiled extract.

FIG. 9.—Blood sugar content of rabbit after mixed meal (M) following the injection of 0.05 gram hydrazine phosphate; 2 D, two days after injection; 4 D, four days after injection; 7 D, seven days after injection; N, normal values before injection; F, fasting level.

FIG. 10.—Effects of intravenous injections of secretin (5 c.cm. and 1 c.cm.), and dilute HCl (5 c.cm. of 0.2 per cent. solution) on the blood sugar of a fasting rabbit.

FIG. 11.—Variations in the sugar content of the blood in a normal person through the day: F, fasting; B, breakfast; L, lunch; T, tea; S, sugar.

FIG. 12.—Scheme of the more important factors controlling the sugar content of the blood.

pancreatic secretion, it is absorbed into the portal circulation, and, reaching the liver, causes injury of the cells, which result in the liberation of glycogen and its rapid transformation into sugar. Subsequent experiments by Hendrix and Crouter[12] have not supported these conclusions, and, in any case, injury of the hepatic cells such as Murlin and Sweet assume cannot be the explanation of the rise in the blood sugar after a meal under normal conditions. It is conceivable, however, that the sugar-producing mechanism of the liver may be sensitive to very slight variations in the hydrogen ion concentration of the blood, such as would be produced by acid phosphates, and that, like the respiratory centre, it may respond to a much smaller change in reaction than the equivalent of the difference between tap water and distilled water. Experiments by Pavlov and his pupils have shown that the amount of alkali secreted by the pancreas is apparently proportional to the production of acid in the stomach, and that secretion by the pancreas begins as soon as the production of acid commences in the stomach; but as it is well recognized that the urine becomes less acid, and may indeed become alkaline to litmus, during gastric digestion (the so-called alkaline tide), it is evident that a proportion of the hydroxyl ions entering the circulation as the gastric glands secrete acid into the stomach are not appropriated by the pancreas for the formation of its secretion and are lost to the body in the urine, thus bringing about for a time a slight, but possibly sufficient, variation in the hydrogen ion concentration of the blood from the fasting level to induce a temporary formation of sugar from glycogen by the liver.

That very slight variations in the reaction of the blood do influence its sugar content is suggested, on the one hand, by the hyperglycaemias of asphyxia and muscular exercise, on the other by the drop below the fasting level we have found to occur in normal persons during the first half-hour or so after a meal, which is the period where the alkaline tide in the urine is apt to occur and there is probably a relative excess of sodium ions passing into the circulation from the stomach.

In one case, for example, specimens of blood were taken at intervals of a quarter of an hour following breakfast, starting three-quarters of an hour after the meal had been commenced. From a fasting level of 0.084 per cent. the sugar fell in the first quarter of an hour to 0.060 per cent., fifteen minutes later it still stood at the same figure, then it began to rise, and in another quarter of an hour stood at 0.080 per cent.; at the end of the hour 0.120 per cent. of sugar was found.

As the result of experiments carried out with a glycerol extract of minced and dried calf liver, at body temperature, with phosphate solutions of different hydrogen ion concentrations and added glycogen, Langfeldt[13] came to the conclusion that, since only inconsiderable hydrolysis occurred at a reaction corresponding to that of the blood and the optimum conversion of glycogen into sugar took place at a hydrogen ion concentration so far on the acid side as to be practically impossible, the regulation of the blood sugar content cannot be exerted through such an influence alone under physiological conditions. When, however, corresponding experiments were carried out with similar mixtures to which 0.6 per cent. sodium chloride had been added, glycogenolysis was found to be much accelerated, more complete hydrolysis of the glycogen occurring at the normal hydrogen ion concentration of the blood, and the optimum being reached at a point representing neutrality. He therefore inferred that, although the liver diastase forms complexes with both phosphates and chlorides which vary in their activity with the hydrogen ion concentration, the chloride diastase compound is the more important. Normally, the reaction of the liver is removed some way on the alkaline side from the neutral point at which chloride-diastase exerts its maximum effect, but when the hydrogen ion concentration is changed through the absorption, or formation, of acids or acid salts, so that the reaction more nearly approaches neutrality, an increasing hydrolysis of glycogen will occur and the sugar content of the blood will be raised accordingly. In this way the practically constant fasting level of the sugar in the blood could be explained and the effects of the passage of hydrochloric acid from the stomach into the duodenum can be accounted for.

The fact that pure liver diastase is inactive has been pointed out by several observers, but Bang[14] was the first to show that contact with sodium chloride is necessary for the development of its glycogenolytic powers in the liver. As the normal resting cell is impermeable to sodium chloride, he came to the conclusion that secretion of bile by the liver cells is a necessary preliminary for its absorption. It is believed that bile is constantly being secreted by the liver, but there is undoubtedly a rapid rise in the output when the stomach contents enter the duodenum; and it is clear from the experiments of Starling and others that this is due to the same cause as the simultaneous flow of pancreatic juice, to which it runs parallel—namely, stimulation of the cells by the secretin formed by the mucous membrane of the intestine. According to Starling,[15] the injection of secretin may double or treble the output of bile. If, as Bang maintains, activation of the liver diastase is dependent upon the cells being rendered permeable to sodium chloride through the secretion of bile, it would seem probable that the entrance of secretin into the portal blood may increase sugar formation by the liver cells, and since the production of secretin appears to be proportional to the acidity of the gastric contents, the quantity of sugar passing into the blood would also vary with the amount of acid entering the duodenum. That secretin hastens glycogenolytic changes in the liver is indicated by the effect of perfusing the surviving liver of a rabbit with a neutralized preparation suspended in Locke's solution, and comparing the results with those obtained on perfusion with Locke's solution alone.

In one such experiment, for example, we found that whereas with Locke's solution alone 70 per cent. of the glycogen originally present had been broken down, with the production of 64 per cent. of sugar in sixty minutes, perfusion with neutralized secretin was followed in the same interval of time by the disappearance of 81.5 per cent. of the glycogen and the formation of 73 per cent. of sugar.

Further confirmation of the direct participation of the liver in the maintenance of the normal sugar content of the blood is furnished by the absence of the usual rise in the ferment value of the blood and the lower maximum level of the blood sugar curve, after a meal, met with in rabbits whose livers have been damaged by subcutaneous injections of hydrazine phosphate, a drug which has a specific toxic action on the hepatic parenchyma[16] (Fig. 9).

We have also investigated the effect of intravenous injections of secretin on the sugar content of the blood in rabbits, and found that there is a gradual rise for about an hour after the injections in all cases, followed by a fall which took place more slowly the larger the dose given. The maximum percentage of sugar reached also varied with the dose, an injection of 5 c.cm., for example, inducing a rise of 0.050 per cent. above the fasting level, whereas 1 c.cm. of the same preparation only increased the blood sugar 0.018 per cent. (Fig. 10). In order to exclude the effect of the acid used in preparing the secretion a control experiment was carried out, in which 5 c.cm. of dilute hydrochloric acid (0.2 per cent.) was injected intravenously; the result was a rise of only 0.004 per cent. in the sugar—a figure within the limits of experimental error. It is therefore evident that secretin raises the sugar content of the blood, and that a sufficient dose will cause as great a rise as the ingestion of food—a meal of dextrinized oatmeal, for example (Fig. 5). Since this effect cannot arise from a change in the hydrogen ion content of the blood, it must be due to the action of the hormone itself.

It is possible, as we have suggested previously, that the action of secretin may be produced through an increased permeability of the liver cells for sodium chloride as a result of an augmented flow of bile, but it seems unlikely that alone would account for such a striking increase in the blood sugar, and it appears probable that some other mechanism must also be set at work by the injection. One naturally thinks of the pancreas, for it is well known to play an important part in carbohydrate metabolism, and its external secretion is controlled by secretin.

Our experiments upon dogs[17] have shown that after pancreatectomy the fasting level of the blood sugar rises as increasing proportions of the pancreas are removed, although as long as about a quarter of the gland is left the increase is comparatively small.

Thus a dog with a normal fasting level of 0.090 per cent. gave a fasting value of 0.120 per cent. two weeks after one-third of the pancreas had been excised, another with the same fasting level showed 0.130 per cent. of sugar a fortnight after a two-thirds pancreatectomy, while a third dog, having a normal

fasting value of 0.084 per cent., gave a fasting value of 0.190 per cent. a couple of weeks subsequent to total pancreatectomy. At the same time the amylolytic ferment of the blood showed a corresponding increase, rising from a normal level of 2 or 3 units to 5 units in the one-third depancreatized animal, 15 units in the dog from which two-thirds of the pancreas had been removed, and 50 units after total pancreatectomy.

These results suggest that the diastase of the liver is, partly at least, under the control of the pancreas, and that as the inhibitory powers of the gland are decreased by the removal of larger proportions, the glycogenolytic powers of the enzyme become more active, so that increasing amounts of sugar pass into circulation, even in the fasting state. If this inference is correct we should expect a corresponding fall in the blood sugar to be produced by additions of pancreas, and this in fact appears to be the case. We have found that intravenous injections into fasting animals of the clear liquid produced by centrifugalizing the extract prepared by grinding fresh pancreas in Locke's solution with sand give rise to a rapid fall in the sugar content of the blood, which reaches its maximum about one hour after the injection has been made (Fig. 8). Since boiling the liquid previous to injection prevents the effect, and there was no evidence of shock or reaction, it is probable that it is not due to a toxic action of the injected protein, but arises from the presence of a substance destroyed by heat, which is most likely, therefore, an enzyme. Experiments described by Kleiner[18] prove that in depancreatized dogs intravenous injections of a watery extract of fresh pancreas cause a more pronounced temporary decrease in the blood sugar than we found in normal rabbits. He further showed that injections of submaxillary gland, spleen, or voluntary muscle induced either an increase or only a very slight drop.

Numerous determinations of the diastase content of the blood before and after a variety of test meals have shown that in both normal individuals and animals it increases and decreases in proportion to the sugar; and since our experiments with depancreatized dogs have suggested that such variations are related to the functional efficiency of the pancreas, it is not unlikely that the rise which occurs during digestion may be the result of a temporary diminution in the internal secretion of the gland induced by the stimulating effect of secretin on the external secretion. Support is lent to this view by a comparison of the effects on the sugar content of the blood of a fasting animal produced by injecting extracts of the resting pancreas and of the pancreas taken at the height of digestion.

In the former case the level of the blood sugar was reduced from 0.092 per cent. to 0.076 per cent., whereas the injection of a preparation of the gland taken three hours after a heavy meal only brought down the sugar to 0.084 per cent. at the end of an hour (Fig. 8). A comparable effect is seen in normal individuals as the result of a series of meals when estimations of the sugar content of the blood are made at hourly intervals throughout the day. We have found that the curves become steeper, and the maximum percentage attained is slightly higher, after each successive meal (Fig. 11), so that a person with a maximum of 0.14 per cent. at the third hour after breakfast may reach a maximum of 0.15 per cent. two hours after lunch, and of 0.16 per cent. one hour after tea.

These changes can hardly be explained by differences in the food taken, or in the hydrogen ion content of the blood and liver, but suggest rather fatigue, and can be accounted for by diminishing control of the pancreas over the glycogenolytic activities of the liver arising from its inability to produce a sufficiency of its internal secretion.

As a study of the factors controlling the sugar content of the blood confined to glycogenolysis would be incomplete, it is necessary also to consider the question of glycogen formation. In 1903 Grube[19] showed by a series of experiments upon surviving liver-pancreas preparations that perfusion with glucose leads to the deposition of glycogen in the liver, and the following year Dovon and Morel[20] reported similar results with glucose injected into the mesenteric veins of dogs; subsequently other observers confirmed their observations. Martz,[21] on the other hand, experimented on isolated livers, without pancreas, and failed to observe glycogen formation after glucose injections. It is therefore evident that the presence of the pancreas is necessary for the deposition of glycogen in the liver, and that this is so is further suggested by the observations of Barrenscheen,[22] who found that when the liver of a dog which has undergone total pancreatectomy some days previously was transfused with dextrose no glycogen was formed, but that after partial pancreatectomy glycogen formation still took place. It is generally agreed that the pancreas influences the formation of glycogen in the liver through an internal secretion, but it is not necessary to assume, as some authors have, that it acts through a special ferment which is directly concerned in the building up of glycogen. It is probable that liver diastase, like other enzymes, is reversible in its action, so that glycogenolysis and glycogenesis go on side by side. When the ferment acts unchecked the disruption of glycogen into sugar predominates, and the fasting level of the blood sugar is raised, but when its glycogenolytic activities are inhibited glycogenesis predominates, and the fasting level of the blood sinks in proportion to the control exerted. The experiments we have quoted suggest that the pancreas exerts such an inhibitory power over liver diastase, possibly by means of an antiferment. This would agree with the changes in the total carbohydrate content of the blood associated with disease of the pancreas we have described elsewhere,[23] and also account for the fact that the liver is never quite free from glycogen, even after total pancreatectomy. It would further explain the lack of any direct relation between the percentage of sugar in the blood and the amount of carbohydrate in the food as long as the latter lies with certain limits, representing on the one hand a maximal stimulating effect on the mechanism of sugar production, and on the other the capacity for glycogen formation existing in the liver at the time the food is absorbed.

The more carefully one considers the normal sugar content of the blood the more certain it becomes that, both in the fasting condition and after a meal, the level is determined by the interplay of a number of influences, some of which accelerate the production of sugar, while others inhibit the process and promote the formation of glycogen, but that under average conditions the food itself takes no direct part in the process. We have considered individually each of the most likely factors taking part; it now remains to discuss them collectively and suggest a scheme which will represent their combined effect.

Summary.

The theory we at present hold is shown diagrammatically in the figure (Fig. 12), and may be summarized as follows:

1. The liver contains a diastatic ferment, the action of which is reversible.
2. In the fasting state the glycogenolytic activities of this ferment are very largely inhibited by (*a*) an antiferment formed by the pancreas, (*b*) the impermeability of the resting liver cells to sodium chloride, (*c*) the reaction of the fasting blood and liver cells.
3. As long as the pancreas and liver are functionally intact and a flow of blood with a normal reaction is maintained, glycogenolysis will be constant therefor and the sugar content of the blood vary within very narrow limits. This is true of all animals of similar constitution, no matter what their habitual diet may be.
4. The entrance of food into the stomach causes a flow of acid, and when this acid reaches the duodenum a formation of secretin results.
5. The secretin (*a*) stimulates the liver cells to produce bile, thus permitting the entrance of sodium chloride, which activates the diastatic ferment; (*b*) causes the pancreas to pour out its alkaline secretin into the intestine to combine with the acid gastric contents, forming acid salts and sodium chloride, which pass to the liver and increase the activity of the diastatic ferment; (*c*) interferes with the formation of the internal secretin of the pancreas, thus diminishing its inhibitory effect on glycogenolysis in the liver.
6. Carbohydrates reaching the liver from the intestine or formed from proteins in the liver are converted into glycogen by the diastatic ferment, the efficiency of the process depending upon the extent to which the glycogenolytic action of the enzyme is inhibited by the internal secretin of the pancreas. Unless the power of glycogen formation possessed by the liver is exceeded, sugar as such, or formed from starch in the intestine, does not pass into general circulation or play any direct part in the rise of blood sugar following feeding.

This theory appears to account for the constant level of the normal sugar content of the blood in a fasting condition and to explain the variations produced by the ingestion of food. It also permits of a reasonable explanation

of the changes occurring in disease. There are no doubt other factors, such as emotional excitement, nervous disturbances, changes of temperature, etc., which affect the percentage of sugar in the blood, but these are probably of comparatively minor importance under normal conditions, and a discussion of their mode of action would not have a material bearing on the subject we are considering, or affect the general principles of the scheme we have outlined.

In conclusion, we wish to express our thanks to Professor Starling for permission to carry out the animal experiments described in his department at University College.

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ANAESTHESIA FOR NOSE, THROAT, AND ABDOMINAL SURGERY BY THE NITROUS OXIDE–OXYGEN–C.E. COMBINATION.*

BY

H. EDMUND G. BOYLE, O.B.E., M.R.C.S., L.R.C.P.,

ANAESTHETIST AND LECTURER ON ANAESTHETICS, ST. BARTHOLOMEW'S HOSPITAL.

In the study of anaesthesia there can be no better or surer way of improving our knowledge than by conferences such as this. Here are gathered together anaesthetists from every quarter of this great continent, all ready and willing to share their knowledge with their fellows for the benefit of mankind in general and anaesthetics in particular.

As regards the administration of nitrous oxide–oxygen–chloroform ether combination for nose, throat, and abdominal surgery, let me begin by saying that I think the two great essentials for an anaesthetist to keep in his mind are (1) the safety and comfort of the patient, and (2) the comfort and convenience of the operator. If we take the first, and most important, I think that in a great many cases safety depends on the knowledge the anaesthetist has of some given method. By this I mean that it is safer for a man to use a method he knows rather than to use another method which in itself is safer but of which he has no knowledge.

When considering this question of safety and comfort of the patient we must include the pre-operative, operative, and post-operative periods. Take the pre-operative time; this includes the preparation before operation, etc. In my opinion there is no need for the drastic treatment that used to be meted out prior to operation; there is no need for that starvation and severe purgation that were in vogue years ago. The patient should be on a light diet and should be given an ordinary laxative. We must remember that any operation entails a certain amount of strain on the patient; it calls for an effort on his part, and he should not be enfeebled by starvation, purgation, and enemata. Of course there are a certain number of cases when it is essential to have the bowel clear, and naturally one does not include these in the above statement.

Pre-operative medication has done much to rob operations of their terrors, and if the patient is given hypodermically some morphine and atropine, or morphine, atropine, and scopolamine, before the operation, he usually comes to the table in a drowsy state with his mind somewhat dulled—a great gain on the condition of years ago, apart entirely from the fact that less anaesthetic is usually needed.

During the last four years I have been endeavouring to find some anaesthetic or mixture of anaesthetics which could be used in combination with gas and oxygen as an adjuvant to produce relaxation when necessary, and in nose and throat work to assist in the maintenance of anaesthesia. I have tried a great many mixtures, and until the introduction of ethanesal recently by Dr. Mackenzie Wallis and Dr. Hewer, I was using as my adjuvant a mixture of chloroform and ether of equal parts. Now I have substituted ethanesal for ether, and I find that the chloroform is only needed for nose and throat work and in some of the abdominal cases. The aim of all who have been working on this matter has been to produce a form of anaesthesia not only safe and pleasant for the patient and adequate for the surgeon's needs, but also as little toxic as possible.

The after-condition of a patient who has been operated on under gas and oxygen anaesthesia ought to be, and is in practice, far better than when ether or chloroform has been given, for since the nitrous oxide and oxygen is non-toxic and quickly eliminated, the patient returns to a normal state far more readily than after the more potent and toxic drugs. After an ether or chloroform administration it takes some time for the drug to be eliminated from the system, and this process of elimination must add to the strain on the patient. The actual technique of the administration is quite simple and the necessary skill is readily acquired.

In 1917, when I read a paper on gas and oxygen with regulated rebreathing in military surgery, I had not then had much opportunity for using this anaesthetic in civil work, but since then I have been using it for a great variety of cases. In 1917 I thought that gas and oxygen was not well suited to abdominal work; I have been trying to form a combination of anaesthetics which would give me adequate relaxation and yet would use the minimum of toxic substances. At the moment I am using as my relaxant a mixture of chloroform and ethanesal of equal parts, so that the anaesthetic becomes a combination of nitrous oxide–oxygen–ethanesal–chloroform, and with this I have been producing a type of anaesthesia which entails but little strain on the patient, and is wholly adequate for the surgeon's needs. The actual technique I employ now is as follows:

The patient is given morphine, atropine, and scopolamine half an hour before the operation. Gas and oxygen is then given in the proportion of about 1 of oxygen to 10 of gas, and as soon as the breathing begins to get deep and regular the gases are allowed to pass over the surface of a mixture of chloroform and ethanesal (equal parts), so that they pick up a small amount of mixture. In a few minutes the breathing becomes automatic, with slight soft stertor, thus showing that anaesthesia has been obtained. The tap on the mixture bottle is then turned back, so that the patient is only having gas and oxygen, and the operation is started. The amounts of gas and oxygen must now be regulated to what the administrator thinks will be the correct amount, and this for the majority of cases is about 1 to 4 (or 1 of oxygen to 4 of gas). For a great number of operations it is quite unnecessary to give any more mixture, and the remainder of the operation is conducted under gas and oxygen.

Given in this way, the anaesthesia is excellent both for patient and operator, whilst the after-condition is extremely satisfactory. The patients readily regain consciousness and are not usually inconvenienced by nausea or vomiting. In addition to this is the fact that they are hardly, if ever, conscious that they have had anything save gas and oxygen, for they do not, as a rule, have any taste or smell of ethanesal or chloroform. This lack of smell and taste of ethanesal and chloroform carries another point worth bearing in mind: Those working in the theatre—surgeons, anaesthetist, nurses, etc.—do not become impregnated with the smell and odour of ether or chloroform—an important point for their own comfort.

I find nowadays in using this method that after a long afternoon in a theatre I can leave feeling quite fresh and well, and the atmosphere of the theatre never becomes laden with the vapour of ether and chloroform as it often did formerly. The small amount of ethanesal or mixture that one needs with this method is sometimes astonishing to those who are unfamiliar with it, for it is quite usual for only a drachm to a drachm and a half to be used during a long operation like, say, the removal of a breast.

Operations such as amputation of the breast, hernias, varicoceles, and the like, are quite easily done under gas and oxygen, and a very small quantity of either ethanesal or mixture; it is when one comes to the abdominal and nose and throat work that the difficulty begins. For some time now many of us have been trying to get some combination to act as a really good relaxant for abdominal

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work. Gwathmey of New York uses a combination of ethyl chloride, ether, and chloroform, while McKesson of Toledo recommends a saturation of nitrous oxide. Personally I have not tried this method up to the present, and I have preferred to rely on my mixture of equal parts of ether and chloroform, but I hope before returning to London to have an opportunity of seeing Dr. McKesson use this method. I have been using this mixture for the last two years, and have only subsituted ethanesal for ether during the last three months, with, I think, a great improvement, not only in the anaesthesia but also in the after-effect, and I am only now beginning to realize what a good relaxation I can obtain, and how easily it is to produce almost at will, and within a few minutes.

Now, turning to the use of this combination in nose and throat work, when I first began to use this method I had nothing to guide me; so far as I knew, my friend Gwathmey of New York was the only man who had tried to give gas and oxygen for throat work, and he had only begun, for the war cut short his work in New York and he came over to Europe. Our technique is, briefly, as follows:

Hypodermic injections (in children, none or at most 1/200 gr. atropine; in adolescents, morphine 1/6 gr. and atropine 1/150 gr.; in adults, hyoscine, morphine and atropine, in Burroughs Wellcome's hyoscine compound "A" or "B") are given half an hour before the time of operation. The patient is then anaesthetized with gas and oxygen, and the anaesthesia deepened with ether or mixture until the breathing is deep, regular and slightly stertorous; the colour should always be pink. The face-piece is then removed, a gag placed in the mouth for those cases—for instance, enucleation of tonsil—when it is necessary, and the anaesthetic is continued by means of a tube placed in the mouth. Let me hasten to say that one of the astonishing things about this method is the small amount of mixture that is necessary to maintain the requisite anaesthesia. Indeed, in a certain proportion of cases hardly any mixture at all is necessary for the rest of the operation—that is to say, after the face-piece has been removed; after that, as I have said, in a certain proportion of the cases gas and oxygen alone is sufficient.

In this connexion I must mention one particular type of case in which I have been forced to use chloroform alone as my adjuvant. I refer to cases of diathermy. In our throat department Mr. Harmer is treating cases of carcinoma of the tongue, fauces, etc., with the diathermy cautery, and, I gather, with excellent results. Occasionally in these cases there is a certain amount of sparking—either accidental or intentional—and so one cannot have any ether in the adjuvant bottle lest there be an explosion, so that one has to use chloroform. In a large number of these cases the best way to continue the anaesthesia is to pass one or two small rubber tubes through the nostrils and lead the anaesthetic into the post-nasal or endopharyngeal space, and I do this by means of a metal stirrup and tubes. A still further development of this method has become necessary when dealing with certain plastic operations on the face and with such cases as laryngo-fissure and the like.

The first occasion on which I used endotracheal gas and oxygen was on October 9th, 1918, for a case of laryngo-fissure. In this case, after the tracheotomy was performed, I gave gas and oxygen by means of a small catheter through the tracheotomy tube, and with excellent result. Since then I have resorted to endotracheal gas and oxygen on many occasions for similar operations and for plastic face operations.

THE VALUE OF SPINAL ANAESTHESIA FOR URGENCY OPERATIONS IN THE AGED.

BY

A. H. SOUTHAM, M.A., M.Ch.Oxon., F.R.C.S.Eng.,

SURGICAL REGISTRAR, MANCHESTER ROYAL INFIRMARY.

THIS method of inducing anaesthesia, for operations upon the abdomen and lower limb, is of distinct value in urgency surgery; particularly so in elderly subjects where the use of inhalation anaesthesia may be a matter of considerable risk. In fifty cases where I have employed spinal anaesthesia, a general anaesthetic being at the time contra-indicated, I have had no difficulties or complications, and in half this number the patients have been 70 years of age or more. In every case the anaesthesia has been completely successful and the results distinctly satisfactory.

In elderly patients where shock, pulmonary and other complications are liable to follow general anaesthesia, spinal anaesthesia should be employed. It can be used for practically all operations upon the abdomen and lower extremity. I have found it satisfactory even when operating upon the upper abdomen, though here more care must be used in handling the abdominal contents, otherwise the patient may complain of discomfort and pain. Pulling upon the stomach is apt to cause retching or even vomiting, and contact with the abdominal surface of the diaphragm gives rise to pain in the shoulder, through the connexions of the phrenic nerve and the cervical plexus.

Spinal anaesthesia has been used with complete success for the following operations: Strangulated femoral, inguinal, and umbilical herniae; intestinal obstruction, acute appendicitis, perforated duodenal ulcer, acute pancreatitis, retention of urine due to enlarged prostate, amputation of lower limb for senile and diabetic gangrene. The following cases will serve as examples of its usefulness:

A male, aged 75 years, admitted with a strangulated femoral hernia of four days' duration. He was very distended, and the vomit was faecal in character. He had well marked bronchitis. His recovery after the operation was uninterrupted.

A female, aged 73 years, with a large strangulated umbilical hernia, cardiac weakness, and a bad chest. She made a satisfactory recovery after operation and her bronchitis became no worse.

A female, aged 64 years, sent in with a diagnosis of perforated gastric ulcer. Her pulse was so irregular and intermittent that it was uncountable. Operation was thought to be her only chance, but the anaesthetist did not consider she would stand a general anaesthetic, her condition being so bad. Stovaine was given. Laparotomy showed she was suffering from acute gangrenous pancreatitis, and the pancreas was freely drained. After discharging sloughs of pancreatic tissue for nearly three weeks she subsequently made a good recovery.

The technique adopted is as follows:

An injection of omnopon, 1 c.cm., and scopolamine, 1/300 gr., is given about half an hour before the operation. For producing the anaesthesia Barker's solution of stovaine, prepared by Billon of Paris, is used. This contains 0.05 gram of stovaine and glucose respectively in each cubic centimetre of the solution. The usual dose given was 2 c.cm., a smaller dose not being found sufficient in adults. For the injection the patient lies on his left side on the operating table, with the thighs and knees well flexed, and the head drawn down to the chest. By this means the intervertebral spaces are opened up and the introduction of the needle facilitated. His head and shoulders are raised on two pillows. The spinal needle, with stylet in position, is inserted between the second and third lumbar vertebrae, a little to one side of the middle line, and pushed inwards and slightly upwards for a depth of 2 to 2½ inches. The stylet is then withdrawn and a few cubic centimetres of cerebro-spinal fluid are allowed to flow out. Two cubic centimetres of stovaine are then slowly injected with the syringe and the needle withdrawn. Absolute asepsis must be maintained during this procedure. The patient is now placed on his back, a single pillow being left under his head and shoulders. It is of great importance not to raise the head more than this.

There is a considerable fall of blood pressure following the injection, due to the loss in tone and dilatation of the vessels of the alimentary canal and lower extremities. If the head is raised symptoms of faintness or even syncope may follow, due to cerebral anaemia. Readings of the blood pressure taken before and after the injection show the pressure may fall as much as 30 to 40 mm. of mercury after the stovaine has been administered. The patient's head and shoulders are therefore only raised sufficiently to prevent the solution reaching and paralysing the vital centres in the cervical cord. If high abdominal anaesthesia is desired, the buttocks should be elevated immediately after the injection, to enable the drug to reach the higher dorsal nerves.

The operation is commenced as soon as the screen and towels are arranged and the surgeon is ready. The patient's expression is watched when the first incision is made to see if the anaesthesia is successful; if not, the operation is delayed for a few minutes until anaesthesia is complete. I have not found that the preliminary injection of omnopon and scopolamine has any ill effects in the aged. It acts as a preventive of shock, and the patient frequently sleeps peacefully throughout the operation and is quite unaware of what is being done. If thirst is complained of, fluids may be given by the mouth.

After the operation is completed the patient must be kept flat in bed for several hours, until the blood vessels regain their tone and the blood pressure returns to normal. An injection of pituitrin may with advantage be given

during this stage. Where this procedure has been carried out I have had no failures and no fatalities due to the anaesthetic. The absence of post-operative shock, vomiting, and pulmonary complications has been remarkable in all cases.

Spinal anaesthesia has also distinct advantages over local anaesthesia in operating for strangulated herniae. It is in these cases often impossible to obtain satisfactory anaesthesia of the parietal peritoneum by local infiltration, and much pain and discomfort are thereby caused to the patient. Further, the pain experienced after operations performed under local anaesthesia is frequently a marked and disagreeable feature.

I would therefore emphasize the advantages of spinal anaesthesia for urgency operations in the aged. Where the patient's condition is so bad as almost to negative operation, spinal anaesthesia enables the operation to be safely undertaken. No preliminary preparation is necessary, and fluids can be taken by the mouth during and immediately after the operation is completed—a great gain to elderly patients. Shock, post-operative vomiting, and pulmonary complications are completely avoided. The extreme relaxation of the abdominal wall makes the handling of distended gut an easy matter in cases of intestinal obstruction.

All these details are of equal importance to surgeon and patient alike, and tend appreciably to reduce the mortality for these operations.

EIGHTY-NINTH ANNUAL MEETING

OF THE

British Medical Association.

Held at Newcastle-on-Tyne, July, 1921.

SECTION OF PROCTOLOGY.

J. P. LOCKHART-MUMMERY, F.R.C.S., President.

DISCUSSION ON OPERATIVE TREATMENT OF HAEMORRHOIDS.

OPENING PAPERS.

I.—Sir C. GORDON-WATSON, K.B.E., C.M.G., F.R.C.S.,
Surgeon, St. Bartholomew's Hospital and St. Mark's Hospital.

AT the Annual Meeting at Cambridge last year, when speaking on the subject of the operative treatment of cancer of the rectum, I affirmed that there was no surgical subject on which surgeons differed so much or had varied their views so often. To-day, in discussing the operative treatment of haemorrhoids, I feel that we are dealing with a subject which is in the main stabilized, but I recognize that there are differences in practice in different schools and details in the technique and after-treatment which may afford useful material for discussion.

For the purpose of this discussion I have prepared some figures based on a series of 1,000 consecutive cases treated at St. Mark's Hospital, and I am much indebted to Mr. Clement Chapman for the trouble he has taken in examining the records and preparing these figures. I think I cannot do better than go through them and consider their bearing on the operative treatment of haemorrhoids.

The first point to note is that, excluding external haemorrhoids, which are in reality haematomata, only 560 out of 904 cases of internal haemorrhoids—that is, 62 per cent.—required to be operated on as in-patients. It is possible that if more beds were available this figure might have been higher, but I do not think it would be appreciably so, because all cases considered to require operation go on the waiting list, and very rarely fail to come in when sent for—that is, they have not sought admission elsewhere. In other words, it is possible to cure some 40 per cent. of cases of piles proper without operation. We are not concerned to-day with non-operative treatment.

With regard to the cases of external haemorrhoids little need be said, for they are cured, and cured quickly, by incision and turning out the clot, or cutting off *en bloc* with or without a local anaesthetic. They have, in my opinion, little relationship to true piles, and are usually due to haemorrhages from the venous radicles of the inferior haemorrhoidals which occur as the result of straining at stool, and are of little consequence unless they become inflamed.

The subject of the treatment of internal haemorrhoids by injections is of some interest and one of the points which I hope will provide fruitful discussion. My personal experience of this treatment is limited to a small number of cases treated some years ago in the out-patient department at St. Mark's Hospital and to an occasional case injected in private. So far as the practice at St. Mark's is concerned, you will see that only 49 cases out of 598 internal haemorrhoids were submitted to treatment by injection, and that the results were as follows: Cured 33, or 67 per cent.; improved 9; required operation 7, or 1 in 7. A perineal abscess followed in one case. It would appear from inquiries made at St. Mark's Hospital that there is a prevalent impression that this form of treatment is freely practised there—an impression which may have arisen from an article having been written on the subject in the BRITISH MEDICAL JOURNAL by an advocate of this method who did temporary work at St. Mark's during the war. The method does not, however, find much favour with the assistant surgeons of the hospital at the present time. Without doubt carbolic injections are most useful for and frequently cure the single bleeding pile, which is a great inconvenience, and yet hardly seems to justify an operation; sometimes by a single injection, but more often after three or four weekly injections. Treatment by injection, so far as experience at St. Mark's goes, is not satisfactory for multiple piles or for the intero-external variety. Failure to replace a thrombosing pile, if it prolapses after injection, may result in active inflammation, and though only one case of abscess occurred in the 49 under review, perianal and even ischio-rectal abscess is well known to be a serious complication of this form of treatment, though probably due to faulty technique. No doubt, like all surgical methods, experience improves results, and it may be that we ought to give a more extended trial to this method, especially amongst those who can ill afford the time to lie up and do not enjoy the benefits of national insurance, out-of-work pay, and the like, and also for those who for some cause or another are unsuitable patients for an operation under an anaesthetic.

The important factor to arrive at is the percentage of cases who, after treatment by injection, subsequently require operation. In the present series of 49, 7 were not cured by injection and required operation—that is, 14 per cent. The author of a recent article in the *Practitioner*, Mr. Eadie, a whole-hearted advocate of injection* in preference to operation, gives injections two or three times a week, and finds that some nine applications are usually necessary for a cure. He goes on to say:

> "There appears to be a tendency for other veins of the anal canal to become varicose when the supporting pressure of the piles is removed, and by seeing the patient from time to time we can inject these as these show in the speculum and before they give rise to symptoms. I therefore like to keep the patient under observation for a year, seeing him every two or three months."

I think that this prolonged period of treatment must prove irksome to the patient, and it seems to me that twelve days or so in bed after a clamp and cautery operation might prove not only more efficacious in the long run but more economical, both as regards time and money. It seems to me, however, that treatment by injection is entitled to more consideration than it has met with in the past, and it is one of the points which I expect to hear freely discussed at this meeting.

The next point I wish to consider is the type of operation to be recommended and the special advantage and disadvantage of each. You will see that in the series under consideration the ratio of the Whitehead operation to ligature is about 1 in 60 and the clamp and cautery to ligature about 1 in 40. At the present time the clamp and cautery percentage is higher, because I believe I am more partial to this operation than either of my colleagues on the senior staff, and during a good part of the period involved in these statistics I was absent at the war. During 1920 there were 272 ligature operations, 23 clamp and cautery, 10 Whitehead, or about 1 in 27 Whitehead to ligature, and 1 in 12 clamp and cautery to ligature.

* Carbolic 10 parts, hamamelis 10, and water 80.

In 1909 Mr. Graeme Anderson, when house-surgeon at St. Mark's, very carefully analysed the results of the different types of operation. At that time Sir Frederick Wallis, who was very partial to the Whitehead operation, was on the staff, and I was then his assistant surgeon. Consequently the results of the Whitehead operation were more easily estimated than they can be at the present time, when very few are performed. Mr. Anderson's estimates were based on 150 ligature operations, 100 Whitehead, and 50 clamp and cautery, and he considered results under the following headings:

1. Pain (severe, moderate, slight).
2. Use of catheter.
3. Return of sphincteric control.
4. Contraction of anal canal.
5. Development of tags.
6. Haemorrhage.
7. Abscess, fistula, and ulceration.
8. Recurrence.
9. Duration of treatment in hospital.
10. Healing of wound.

I think it will assist this discussion if I refer now to some of these headings.

1. *Pain.*

The degree of pain experienced in the three following operations—whether severe, moderate, or slight—may be tabulated thus:

	Severe.	Moderate.	Little.
Clamp and cautery ...	0 %	30 %	70 %
Ligature	10 %	57 %	33 %
Whitehead operation	16 %	56 %	28 %

The small amount of pain which follows the clamp and cautery operation compared with the other operation should be noted. Should, however, any skin be included in the clamp pain is severe.

The relationship of pain to stretching of the sphincter deserves consideration. Graeme Anderson found that the degree of stretching seemed to bear but slight relation to the degree of pain. At the present time the practice at St. Mark's is not to stretch the sphincter unless, owing to chronic spasm and hypertrophy in long-standing cases, the piles cannot be brought down without stretching. In my opinion it is not necessary to dilate in the majority of cases. When the sphincter is relaxed under anaesthesia, the anal mucosa can usually be everted with the fingers and the piles pulled down with forceps. Gentle dilatation is harmless, but the tone of the sphincter varies greatly in individuals and with the degree of anaesthesia. If the sphincter is stretched in the accepted sense so that it remains flaccid, muscle fibres are sure to be torn, and effusion amongst the fibres, just as in traumatic rupture of a limb muscle, will occur and be followed by tension, swelling, and pain. The risk of post-operative haemorrhage is increased when the sphincter has lost its tone and does not contract down on the tube after recovery from the anaesthetic. If the sphincter is injured during the cutting stage or any fibres included in the ligature pain is increased.

2. *Use of Catheter.*

The catheter was used in 10 per cent. of the ligature cases; in 6 per cent. of the Whitehead operations; and in none of the clamp and cautery cases.

The requirement of the catheter varies with the nervous temperament of the individual and with the degree of pain caused by the operation. Hot fomentations, the upright position, and copious drinks, which should include imperial drink, will minimize the necessity for the catheter.

3. *Sphincteric Control.*

Graeme Anderson tested the return of sphincteric control in three ways: (1) The ability to retain a pint enema; (2) adequate warning before defaecation; (3) ability to distinguish between passage of flatus and motion. The average dates of return in the 300 cases were: sixth day clamp and cautery, tenth day ligature, twelfth day Whitehead. At the present time at St. Mark's the sphincter is not stretched, so that control is not lost.

4. *Contraction of Anal Canal.*

None of the clamp and cautery cases showed any tendency to contract. Of the ligature cases, 55 per cent. showed no tendency, 40 per cent. slight contraction easily remedied by digital dilatation during the third week, 5 per cent. showed marked contraction requiring dilatation up to six weeks after operation. All these did well later and showed no further tendency to contract, and occurred in patients who left the hospital earlier than usual and had neglected digital dilatation.

It is interesting to note that at the present time the out-patients' surgeons report that contraction is becoming more frequent, and the explanation is that we have been discharging cases on the twelfth day for some time past and giving instructions to patients to attend the out-patients' department once a week. Many of them go away for two or three weeks before coming to out-patients. At the time that Mr. Graeme Anderson collected his statistics the ligature cases were being kept in for three weeks, and digital dilatation was carried out during the third week.

5. *Tags.*

In 6 per cent. of the clamp and cautery, 15 per cent. of the ligature, and 5 per cent. of the Whitehead cases, large tags formed which required removal under local anaesthetic during the third week. In 50 per cent. of the clamp and cautery, 40 per cent. of ligature, and 70 per cent. of the Whitehead cases, there were practically no tags; and in 44 per cent. of clamp and cautery, 45 per cent. of ligature, and 25 per cent. of Whitehead cases, there was decided tag formation, which subsided in from four to twelve weeks. My personal experience has been that tag formation is more difficult to avoid with the clamp and cautery than with other operations, but that it is never an important post-operative factor.

6. *Haemorrhage.*

Eight cases of post-operative haemorrhage occurred in the 300 operations, of which 4 were due to secondary haemorrhage, 2 after ligature (ninth and tenth days), or 1.3 per cent., and 2 after the Whitehead operation (sixth and eighth days), both cases of sepsis after operation for gangrenous prolapsed piles. The other 4 cases were trivial recurrent haemorrhage—1 after clamp and cautery and 3 after ligature.

7. *Abscess, Fistula, and Ulceration.*

None of these complications occurred after clamp and cautery. Two ligature cases developed chronic infected ulceration with stenosis. Sepsis and retraction occurred in four Whitehead cases, three of them cases of gangrenous prolapsed piles, and in two of the latter secondary haemorrhages occurred. The fourth case left the hospital in good condition but became infected later, probably during digital dilatation, and developed a severe infective proctitis. The clamp and cautery again comes out on top. The clamp produces a longitudinal cicatrix which is not under tension, the vessels and lymphatics are sealed off by the cautery and no ligatures are employed—all factors which tend to minimize sepsis. I am convinced that it is the best operation for prolapsed and gangrenous piles, and that the Whitehead operation should not be employed in these cases.

From time to time cases of infective ulceration occur after the ligature operation, and this troublesome condition may occasionally spread in the ward so that clean cases become infected. Great care is necessary in sterilizing nozzles and rubber tubing used for enemas, etc., and in making digital examinations. Cases of infective ulceration should be isolated. Whether the silk used is a contributory factor I do not know, but it is somewhat remarkable that silk ligatures left long round the pile stump and readily absorbing faecal matter during action of the bowels do not induce sepsis commonly. That they do not is clear from the figures I have quoted. I have no figures to show whether the use of catgut instead of silk for the ligature operation gives greater immunity to contraction and ulceration.

Preparation for Operation and After-Treatment.

Uniformly good results depend very largely on the preparation for operation and the after-treatment. The

following is a summary of the treatment adopted for my cases at St. Mark's:

The patient is admitted two days before operation, preferably at noon.

Preparation.

Tuesday: Before 8 p.m., Ol. ricini 1 oz.

Wednesday: In the morning, Mist. alba 1 oz.; after 5 and before 8 p.m., Enema saponis 2 pints, Mist. catechu 1 oz.

Operation.

Thursday: 5 a.m., Enema saponis 2 pints; 5.30 a.m., Mist catechu 1½ oz.; 10 a.m., Omnopon 1/6 grain. 2 p.m. and after operation,

Half an hour before operation a hypodermic injection of morphine 1/4 or 1/6 grain, with atropine 1/100 or 1/120 grain, is given.

If the second enema result is reported coloured, a plain water wash-out is given.

Diet.

Tuesday—

Noon: Meat or fish, potatoes, bread and pudding.
Tea: Tea, half a pint, bread-and-butter, jam.
Supper: Soup, half a pint.

Wednesday—

Breakfast: Tea or coffee, half a pint, bread-and-butter or toast.
Noon: Beef-tea, half a pint, bread and pudding; no fruit.
Tea: Tea, half a pint, bread-and-butter.
Supper: Beef-tea or cocoa, half a pint, bread.

Thursday—

Breakfast, 5 a.m.: Tea, half a pint, two pieces of bread-and-butter.
11 a.m.: Beef-tea, half a pint.

The mouth should be washed and the teeth brushed before operation.

Note: Eggs are not given for two days before operation.

Diet after Operation.—On the day after operation the same diet as the day before is given; afterwards ordinary diet with fruit and eggs may be given.

After-Treatment.

First Day.—Renew outer dressing only if there is no bleeding. If the patient does not complain of the tube giving discomfort, it is kept in for three days—it helps to keep down external tags. (The tube is ¾ in. in diameter and 3 in. long.) If the patient is not able to pass urine, the tube is removed after fourteen hours.

Second Day.—Change all dressings and irrigate with H_2O_2 (vol. 10); dress with a wool swab prepared in mercury perchloride 1 in 2,000, outside dressing pad of wool. Keep pressure with T bandage.

Third Day.—Evening: Olive oil injection, 5 oz. (sterile), to be retained; dress always as above.

Fourth Day.—Give aperient, ol. ricini 1 oz. If when the bowels have acted there is no bleeding, the patient starts daily baths.

Clamp and cautery and Whitehead operations wait one or two days longer for aperient. Whitehead cases are dressed and irrigated every four hours—gauze and flavine.

If a patient develops ulceration, four-hourly wash-outs of normal saline are given, then injections of flavine vaseline 1 per cent. If there is only slight ulceration, ordinary dressings are used with the addition of iodex or iodoform suppositories twice a day. If the ulceration is bad the patient is isolated.

Choice of Operation.

The ligature operation in the absence of acute inflammation is suitable for all cases, and because of its simplicity should be the operation of choice in the great majority of cases. Clamp and cautery is an admirable operation in selected cases, and when the case is a suitable one for this operation it has, I think, decided advantages over the ligature operation. It is bloodless, and pain after operation is less than after ligature or Whitehead. The average length of stay in hospital is shorter than after the ligature operation. Contraction never occurs, and, as I have shown, all post-operative complications are less prone to occur than with the ligature or the Whitehead operation. Contra-indications are as follows:

1. When haemorrhoids are partly covered by skin the operation, unless combined with a cutting operation, is unsuitable; consequently a third or more of the cases are ruled out.

2. When the haemorrhoids exceed three in number or cannot be grouped into three clamps (or four at most) it is not suitable, partly from manipulative reasons, and partly because there is not enough mucosa available in the circumference of the anal canal to allow more than three (or at the most four) haemorrhoids to be clamped at one and the same time. To apply a clamp in one place after the cautery has been used in another presents obvious dangers.

The operation is especially suitable:

1. In strangulated cases, or cases of prolapse with inflammation, when operation cannot be delayed for fear of strangulation.

2. For patients who require to get back to their work as quickly as possible.

3. For the aged, debilitated, anaemic, and very nervous people, who require to be spared as much pain and loss of blood as possible.

Against the operation is the fact also that it is less foolproof than the ligature operation. An inefficient clamp and cautery operation might be followed by violent recurrent haemorrhage (though I have no knowledge of any such case occurring), and in consequence is not, I think, so safe an operation for private practice, at any rate outside a nursing home. Stout ligatures give a greater sense of security to the surgeon at a distance. As regards secondary haemorrhage, figures show that the clamp and cautery operation is no more liable, if anything less liable, to secondary haemorrhage than the ligature operation. The clamp and cautery operation, however, is more prone to produce large tags.

The Whitehead operation is a radical method which gives excellent results in experienced hands. For the great majority of cases, however, it is an unnecessarily severe operation, involving, as it often does, considerable loss of blood. Great care is required in the after-treatment to avoid anal stenosis or extroversion of mucosa with a moist anus, which is often followed by pruritus ani. In some instances incomplete control both of flatus and faeces follows the operation, the result, I think, either of sepsis or imperfect after-treatment producing a fibrous ring round the anal margin which does not readily yield to the action of the sphincter. The average length of stay in hospital of patients operated on by Whitehead's method is nearly double that of the clamp and cautery operation. It is, I think, the best operation in skilled hands when there is a complete and extensive ring of haemorrhoidal tissue and bleeding is a marked symptom, or when haemorrhoids are complicated by severe pruritus ani or by multiple anal fissures and submucous pockets (the pre-fistulous state). It is not a good operation for the inexperienced surgeon.

Summary.

To summarize: the surgeon who is familiar with, and practises, rectal surgery can secure excellent results with all three operations, and should, I think, use all three according to the case in hand, using the ligature most, and the Whitehead least. The general practitioner who dabbles in surgery will, I think, secure the best results if he sticks to the ligature operation, and he will do well to study the methods of those who operate frequently in these cases; for though the technique is simple the minor details are important, and make all the difference to the comfort and cure of the patient.

Some Statistics on 1,000 Consecutive Cases of Haemorrhoids at St. Mark's Hospital.

External haemorrhoids only	96
Internal haemorrhoids only	598
Internal and external	306
	1,000
Treatment:	
Treated without operation	330
External haemorrhoids operated on as out-patients under local anaesthetic	61
Internal haemorrhoids treated by injections as out-patients	49
Cases admitted and operated on	560
	1,000
Operations:	
Ligature	536
Clamp and cautery	15
Whitehead's operation	9
	560

Two deaths from bronchopneumonia = 0.35 %.

Complications following Operation:	
Constriction (however slight)	58
Tags (however slight)	53
Fistula	6
Secondary haemorrhage	5
Submucous abscess	2
Fissure	1

Treatment by Injections as Out-patients.—Of 49 cases treated by injections of 20 per cent. carbolic acid in glycerin (5 to 10 min.), 33 were cured and 9 improved. Operation was subsequently required in 7 = 1 in 7. The only complication was an abscess in one case.

Recurrence.—Of the 1,000 cases dealt with, 29 had had a previous operation for haemorrhoids. Of these 29, only 11 were submitted to a second operation; in other words, the recurrence percentage requiring re-operation is about 1 per cent.

II.—D. P. D. Wilkie, O.B.E., F.R.C.S.,
Assistant Surgeon, Edinburgh Royal Infirmary.

In dealing with a condition such as haemorrhoids, which, although causing much inconvenience, and frequently suffering and interference with the general health, does not threaten life, we must assess very carefully whether any appreciable risk attaches to operative treatment and how such risk may be reduced to a minimum; secondly, we must consider the question of suffering associated with the operation; and thirdly, whether the prospect of relief or cure by the operation is reasonably secure. I would therefore consider the operative treatment under the three headings—dangers, discomforts, and disappointments.

Dangers.

The risk attaching to an operation for haemorrhoids is very small, not even more than 0.2 per cent. It is, however, an operation with potential risks, for it is carried out on an area which is both vascular and septic, and unless certain principles are attended to, an unfortunate result is bound to occur sooner or later. Haemorrhage is a surprisingly rare complication in my experience. I have never encountered a case of reactionary haemorrhage, and have met with but one case of secondary haemorrhage, occurring on the eighth day. The best treatment for the latter is ligation of the bleeding point after free exposure under an anaesthetic.

Sepsis, although always a factor present in some degree, seldom threatens danger. It must not be discounted altogether, however, and I can recall three cases seen in the *post-mortem* room where death occurred from sepsis following an operation for haemorrhoids. The infection may attack and may spread along either (1) the veins, causing a phlebitis which may be portal or systemic, or (2) the cellular tissue planes of the submucous coat of the rectum, giving rise to a dissecting cellulitis which may later invade the pelvic cellular tissue, and is apt to be complicated by a septic bronchopneumonia. Spreading septic phlebitis is, fortunately, a very rare complication, less frequent, indeed, after operation than without operation. Dissecting cellulitis may be prevented by allowing of free drainage after any wound of the rectal wall. A complete closure by suture of a rectal wound is always a mistake, and has been responsible for some unfortunate results.

Discomforts.

Post-operative pain and retention of urine—the two bugbears of the operation from the patient's point of view—are, in my experience, due to one or more of three faults in the operation. First and foremost, failure to provide free drainage, with consequent oedema of the anal region; secondly, the inclusion of a few fibres of the sphincter muscle in the ligature or stitch applied to the base of the haemorrhoid; thirdly, bruising and tearing of the sphincters from forcible and excessive stretching. The latter procedure is usually unnecessary altogether, and if required should be done slowly and gently. There need be relatively little pain associated with the operation, and retention of urine is quite unusual if the foregoing points are attended to.

Disappointments.

Stricture following the operation is happily rare. The only cases of stricture which I have seen have been after an imperfectly performed Whitehead's operation. In my opinion this operation should never be performed. A good rule in any operation for haemorrhoids is to err on the safe side by removing too little tissue rather than too much, provided always that no actual formed haemorrhoid is left behind. Recurrence after any well-executed operation is quite exceptional. If met with, recurrence is usually early, and is really a continuance of the trouble owing to one or more piles having been left behind. My experience of haemorrhoids is that the majority of cases requiring operation are of the combined intero-external type—an internal haemorrhoid directly associated with an external haemorrhoid. My remarks in regard to operation will therefore refer to this type.

Operation.

The only operations which at the present day demand consideration are the injection method, the clamp and cautery, and the ligature operation in one form or another. I have had no personal experience of the injection method. Of the clamp and cautery operation I can say, from a limited experience, that it is the most painless of all the operations, and that it appears to be singularly free from risk; my only objection to it is that it is perhaps less radical than some forms of the ligature operation. The ligature operation is carried out in so many different ways, and so many details unite to make each surgeon's procedure a success in his hands, that the most helpful contribution to the discussion must be a full statement of the method which each surgeon employs. My own practice is as follows:

The bowel is cleared by a dose of castor oil, ʒj, thirty-six to forty-eight hours before the operation. On the evening before a soap-and-water enema is given, followed by a boracic wash-out. No enema is given on the morning of operation, as a bowel at rest is an essential condition.

A general anaesthetic is used, and when the patient is fully under, the piles will usually prolapse; if not, the sphincter is gently stretched. The individual piles are caught in forceps, and the more posterior ones dealt with first. A V-shaped incision is made through the skin and muco-cutaneous junction over the external part of the haemorrhoids, and the skin is stripped backwards from the veins. The connexion between the external and internal haemorrhoidal veins is now evident, and the two can be dealt with together either by transfixion and ligature or by over-stitching the clamps after the method of Mitchell. In either case the lower end of the wound is left open, the skin at no point being included in the ligature or suture. In stripping up the external haemorrhoidal veins the external sphincter is usually exposed, and can be avoided in the later stages of the operation. Catgut is used for all ligatures. A mixture of vaseline and iodoform, or bipp, is applied within the anus and on the dressing. No flatus tube is used and no suppository is given.

Heroin, 1/12 grain hypodermically, is given if required on the afternoon or evening of the operation. As soon as the patient recovers from the effect of the anaesthetic he is given liquid paraffin, a dessert-spoonful three times a day, and on the morning of the fourth day olive oil ʒiv by the rectum, followed by castor oil ʒj by the mouth. Not infrequently, however, the patient has an almost painless action of the bowels before the dose of castor oil is given, and it is a question if the latter is required. The patient is kept in bed for eight to ten days, and continues to take liquid paraffin for a month at least after operation.

As in so many operations, so in that for haemorrhoids, attention to details before, during, and after the operation makes all the difference between a picnic and a purgatory.

DISCUSSION.

Dr. Louis J. Hirschman (Detroit, U.S.A.) said: I assure you that I appreciate the honour of being asked to address you as a representative of American proctology. The wonderful papers to which I have had the pleasure and profit of listening have made my long journey across the Atlantic well worth while. In order not to consume valuable time I am going to confine myself to a brief discussion of two or three points brought up by the previous speakers. The subject of anaesthesia has been mentioned, and I would like to state that in America the majority of proctologists are using local anaesthesia to a far greater extent than is being done on this side of the water. In our personal practice we operate upon practically all cases of haemorrhoids, fissures, polyps, and all other kindred diseases of the rectum and anus under local anaesthesia unless there is some very decided reason for using general anaesthesia. About 25 per cent. of our fistula cases are operated upon also under local anaesthesia. We find that the more we operate under local anaesthesia the wider is its field. We frequently combine the use of sacral anaesthesia with that of purely local anaesthesia. In our practice we employ novocain in a strength not exceeding one-half of 1 per cent., and the quantity of solution used is governed by the individual case.

The type of operation used by almost all the American proctologists is some modification or other of the incision and ligature method. The use of the clamp and cautery is restricted to those cases where there is a great amount

of prolapse, for the cicatricial contraction following a burn is of distinct advantage in the ultimate result following an operation for prolapse.

Sir Charles Gordon-Watson mentioned the injection method of treating internal haemorrhoids, and has asked for a word or two in discussion. We do not use carbolic acid at all in our practice. We get very good results from the employment of a 5 to 10 per cent. solution of quinine-urea hydrochloride. Each haemorrhoid is injected to mild distension with this solution, and is reinjected at the end of five to seven days if necessary. We have found that this solution causes a deposition of fibrin around the blood vessels of the haemorrhoids, which, becoming organized, shuts off the circulation to such an extent that the mass rapidly atrophies. If one is particular to inject the solution deeply into the tumour, and not to deposit it directly into or beneath the mucous membrane, sloughing is never encountered. The average length of time for a haemorrhoid patient to be entirely relieved is from three to four weeks.

The Whitehead operation has been mentioned by two or three of the preceding speakers. We never employ it, because we believe that, no matter how severe the case, there is always a better way of disposing of the redundant mass by elliptical excision. The resulting scars are always in the longitudinal axis of the bowel, and the functional result is ideal. I think that the less we talk about the Whitehead operation the sooner it will be discarded. It is emp'oyed mostly by the "surgical dabblers" of whom Sir Charles Gordon-Watson has spoken. It is their unfortunate results which have brought prejudice upon the surgical treatment of haemorrhoids.

I have been tremendously interested in the presentation of the subject, and have been gratified to have had the honour of being the guest of the Association at this meeting. I trust that the Section of Proctology of the American Medical Association, of which I have the honour of being the chairman, will soon have an opportunity of welcoming some of your members as our guests in the sister country of the United States of America.

Mr. Ernest Miles (London) said he considered the operation for internal haemorrhoids simple and safe whatever method were used. There should be no failures; therefore when failures did occur one must inquire very carefully their cause. He pointed out that there were three stages in the development of piles; one cause of failure was that early piles were overlooked because they were obscured by others more advanced. Again, there were three primary fixed positions for haemorrhoids, besides four other secondary positions where they might develop. When all these positions were not carefully examined a pile might be missed. This might happen through imperfect exposure of the haemorrhoidal area, a common cause of which was the submucously situated pecten band, upon which the speaker had previously laid emphasis. This band should be divided by a knife. Again, a bad operation might be chosen. He had no hesitation in saying that such an operation was Whitehead's. He did not deny that good results could be obtained from Whitehead's operation, but after performing three different series of Whitehead's he had come to this conclusion, that it was a bad operation because in 9 or 10 per cent. of the cases bad results were obtained owing to such causes as, for example, a tendency to the formation of keloid on the part of the patient, which were quite out of the control of the surgeon. As regards the treatment by injection, he had had considerable experience of its results as performed by others; for when he was in France he had seen 139 cases that had been injected at thirty-seven different hospitals, all of which had subsequently to be operated upon.

Sir Charles Ryall, C.B.E. (London), said that no operation gave such consistently satisfactory results in all variety of cases as ligature. Whitehead's operation, though excellent in many ways, frequently gave unsatisfactory results even in the best hands. The ordinary human being was able to tell whether the rectum be empty or loaded, and whether the contents were gaseous, liquid or solid, and this was due to what might be called "anal sense." Whitehead's operation, by frequently interfering with the sensitive skin of the anal canal, sometimes caused impairment and even loss of anal sense, and this was a severe disability. Ligature was a very simple operation, and in surgery one ought to resort to the simplest measure which obtained the desired result, and, above all, teach this measure, as it was so much less harmful in the hands of an inexperienced surgeon. With regard to interstitial injections, he considered they gave very good results, and this method of treatment was especially useful in the aged and debilitated, but at the same time one could not call it a cure. It was treatment not free from risk, the main one being tissue necrosis causing severe haemorrhage. He remembered being called to a case of haemorrhage, which proved fatal, where this method of treatment had been resorted to.

Mr. Cecil Rowntree (London) said that he thought the Section was to be congratulated upon the excellent discussion evoked by Sir Charles Gordon-Watson's paper and upon the choice of a subject which made such a wide appeal. His own experience of the operative treatment of haemorrhoids could not compare with that of other speakers, but he had had large opportunities of observing the results of many different kinds of operations. Some years ago he had had the privilege of becoming associated with Mr. Miles, and he had learnt from him the exact technique of the ligature method as employed by him. Since then he had used no other method, as he regarded it as the safest, most effective, and the most universal in its application. Whitehead's operation was, he thought, thoroughly bad as ordinarily employed, for it was an extraordinary fact that it was the method generally selected by the inexperienced surgeon, possibly because it gave more opportunity for blood-letting than any other method with which he was familiar. During the war he had had some considerable experience of secondary operation for haemorrhoids, and he nearly always found that Whitehead's operation had been the method originally selected. With regard to the question of stretching the sphincter, his own belief was that it originated as a consequence of difficulties experienced by many anaesthetists in obtaining complete relaxation. In such cases stretching was essential in order to obtain exposure. He had had his share of these difficulties, and had got over them very easily and completely by using spinal anaesthesia, which gave complete relaxation and perfect exposure. He was therefore in agreement with the last speaker in thinking that dilatation was not only unnecessary but in fact harmful.

Mr. J. P. Lockhart-Mummery (London) thought the meeting was to be congratulated on the very excellent discussion that had taken place. One point at least had been definitely decided—namely, the question of Whitehead's operation for piles. He thought it was certainly time that the obituary of this operation should now be written. While everybody seemed to condemn the operation, nobody had been found to defend it. Personally, he would feel some regret, as operations for correcting the bad results of Whitehead's operation had always been a steady source of income for many years. He agreed with the other speakers that, as a general routine, a ligature operation was the best, but that the clamp and cautery was a very good operation in certain cases.

The question of pain after operation had been mentioned by most of the speakers, and in his opinion the question of post-operative pain was almost entirely one of sepsis. Assuming that the surgeon was reasonably skilled in performing the operation, and was not one of those surgeons who operated, as had been described by Crile, like the carnivora, there should be no pain after operation, provided the parts can be kept aseptic for the first forty-eight hours. Although this was difficult, it was by no means impossible, and, in his experience, pain was now quite an exception after an operation for piles when proper aseptic precautions were observed.

The method he preferred for getting the bowels open was to use liquid petroleum, given by the mouth the day after operation, assisted by a small enema on the second or third day. He had quite given up the use of castor oil or any purge for this purpose, and believed it quite unnecessary. Also, he thought, a very important point was the question of diet. He never allowed his patients to be put on a slop diet, but gave them ordinary solid food from

the beginning, and since doing so he had had far less trouble from wind pain and distension.

He agreed with the other speakers that while the injection treatment for piles was useful, and had a very definite place in the treatment of this complaint, it should not be looked upon as a substitute for operation. It was really only a good and useful form of palliative treatment. Recurrence of the piles after injection was the rule rather than the exception, but there would always be a certain number of cases where operation was for some reason or other contraindicated, and in which the patient could be given relief by injection. Injection was a treatment requiring a good deal of practice and a certain amount of skill, and, except in skilled hands, was liable to be followed by complications which were no less serious than those following operation.

Sir CHARLES GORDON-WATSON, in reply, expressed gratification that the meeting had, on the whole, expressed agreement with his views. With regard to Dr. Hirschman's statement that the American proctologists had abandoned carbolic acid for quinine and urea hydrochloride as the best substance for injection, he would mention that they had made experiments at St. Mark's with a view to ascertaining the best compound for that purpose, and carbolic acid had given the best results. He did not believe in transfixion of the piles before removal. He thought that in cases in which transfixion was used there was danger of pulmonary embolism. He thought that the American practice of allowing the patients to get up three to seven days after an operation for haemorrhoids, performed under local anaesthesia, was to a certain extent dangerous, for it was from the sixth to the tenth day after the operation that there was a certain liability to secondary haemorrhage. Sooner or later a surgeon who allowed his patients to get up so early would have an unpleasant experience.

Mr. D. P. D. WILKIE also referred to the excellence of the discussion, and said that he was particularly interested in the use of sodium bicarbonate instead of soap for enemata, and that he would certainly try it. He said that he would try the method mentioned by one speaker of giving liquid paraffin to open the bowels after operation in one large dose instead of several small doses, as being less likely to upset digestion. With regard to spinal anaesthesia, he had been effectually deterred from using it, except in very special cases, by seeing in Bier's clinic (and Bier had had an experience of spinal anaesthesia amounting to thousands of cases) an unfortunate patient who had been submitted to spinal anaesthesia nine months previously and had been paraplegic ever since.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

IONIZATION IN SUPPURATIVE OTITIS MEDIA.

No doubt the recent discussions on ionization, at the Royal Society of Medicine and the annual meeting of the British Medical Association, will lead many to try this method of treatment. I can foresee what may often happen. A case of otorrhoea turns up. The patient is laid on the couch. The ear is cleaned and a warm 0.25 per cent. solution of zinc sulphate is poured into the meatus. The positive electrode is inserted and a current of 2½ milliampères is turned on for ten or twelve minutes. Next day the ear is cleaner, but the day after it is discharging just as usual. Another case is tried with much the same result, and perhaps one or two more. Then the conclusion is arrived at that ionization is no good. Next time the subject comes up for discussion the above experience is related and a vote cast for the "nays." In the hypothetical cases just related no fair trial of the treatment has been made.

It cannot be too emphatically pointed out that this treatment is suitable only for certain cases of tympanic sepsis. The surgeon must always bear in mind that the zinc ions sterilize only in the area with which the solution is in contact. If the solution does not reach all the infected area all labour is in vain.

The first essential, then, is diagnosis. All cases of chronic mastoiditis must be excluded. In cases secondary to oral and pharyngeal sepsis the primary cause must first be treated. The opening in the membrane must be adequate. The perforation must be of sufficient size to admit a cannula through which the middle ear can be washed out with zinc solution. Polypi in the middle ear are not an absolute contraindication. An effort may be made to get rid of them if they are small and there are no signs of chronic mastoiditis, but until the polypi have been got rid of the case is not suitable for ionization. Cases of cholesteatoma form another doubtful class. If the cholesteatomatous débris can be washed out by intratympanic irrigation, and if the cholesteatoma has not spread to the mastoid cells, ionization will improve the condition.

In suitable cases the results of ionization are often almost magical. Over a year ago a girl of 21 was attending the Central London Throat Hospital; her otorrhoea had been continuous since childhood. For nearly a year she had been treated by others and myself at the hospital with the usual antiseptic methods. Her case was eminently suitable for ionization—a large perforation, no polypi, clean mouth and throat, and no signs of septic absorption, such as headaches, giddiness, etc. I ionized her with the usual ritual. Next day the ear was dry and has remained dry ever since. Even one case like this compels one to welcome ionization. Several other cases yielded equally good results. Some relapsed. All the cases which did not conform to the above postulates of suitability were unaffected by the treatment. My personal experience is that ionization is a most valuable form of treatment, but I would impress on those about to try it that they are doomed to failure unless they try it on suitable cases.

T. B. JOBSON, M.D.,
Surgeon to the Ear, Nose and Throat Department, Royal Surrey County Hospital, Guildford.

TREATMENT OF ASTHMA.

I HAVE NOW treated thirty cases of asthma and asthma-like seizures with subcutaneous injections of the patients' own blood. My attention was drawn to this method of treatment by the account of somewhat similar treatment used in cases of migraine.

A 10 c.cm. serum syringe, having a needle with a somewhat large bore, is filled with boiling liquid paraffin and emptied, leaving a film of paraffin on the glass and needle. A large-bore intravenous needle is used to draw from 5 to 10 c.cm. of the patient's blood, according to the weight of the person treated, direct into the syringe with the piston removed and the needle in place; the syringe should be about blood temperature. The piston is replaced, air is expelled, and the blood is injected subcutaneously into the patient's back towards the inner side of the lower angle of the shoulder blade.

The cases treated were examples of asthma and of asthmatical seizures occurring in bronchitis, acute and chronic. Of nineteen cases of asthma (seven in Europeans and twelve in natives), five were cured and fourteen improved. Two instances of asthmatic attacks in acute bronchitis and six in chronic bronchitis were improved. Of three cases of asthmatic attacks in Europeans occurring in chronic bronchitis of a severe type following influenza, one was cured and two improved.

The apparently cured cases were those watched over three months without a relapse or any discomfort. The improved cases, all but one, had the same history—a complete cessation of asthmatic spasm for a time, varying from a week to two or three months. Bronchitis seemed to be improved but not cured by the treatment. Of the improved cases, twelve have had a second injection, two have had three injections; in these I gave half the amount given originally; all but one of these have been at once relieved.

The one exception among asthmatic attacks in bronchitis following influenza was a young woman whose bronchitis had lasted for over two years, and had reduced her to a wretched condition; she was thin, listless, sleepless, with a hard cough and slight sputum occasionally tinged with blood. Every few weeks she would have violent asthmatic attacks lasting for four or five days. She was tested for tuberculosis repeatedly, and by many different men, without result. After the first injection given for the asthma, and during an attack, the asthma ceased, and the bronchitis almost disappeared, but returned as badly as ever on the eighth day. I repeated the injection, which only seemed to make the condition worse, and a further

injection proved useless. This case cleared up under intravenous injections of electro-argol.

Of course this is only a preparatory excursion; it will take time to consolidate the treatment and classify the cases in which it will be of use, lasting or temporary.

Eshowe, Zululand, South Africa. G. H. Wildish, M.B.

Reviews.

PULMONARY TUBERCULOSIS.

Although Sir James Fowler more than once insists that his *Pulmonary Tuberculosis*[1] is intended for students who are either still at a medical school or are engaged in the practice of the profession, no one, even the critics—who by a famous definition may be supposed to have retired on account of failure—can read this retrospective volume, brightened by many personal sidelights and *obiter dicta*, without pleasure and benefit. During his professional life Sir James has not only seen, but taken an active part in, many changes that have come over our conceptions of pulmonary tuberculosis; his advocacy of this name in the place of "phthisis" and of the abandonment of "the stages of phthisis," his demonstration of the march of the tuberculous infection, and the part he took in the nineties in the introduction of sanatorium treatment into this country, entitle him to speak with authority and not as do the scribes. Many medical men have wondered why a second edition of Fowler and Godlee's *Diseases of the Lungs* (1898) never appeared; to some extent the desire for a new edition is now satisfied by the present volume with its riper experience, appropriately dedicated to "Rickman John Godlee, a Master of the medico-chirurgical Art."

His review of the history of tubercle and pulmonary tuberculosis is noteworthy for the unearthing of William Stark's (1740–1770) work, which, hitherto almost entirely neglected except by Professor William Bulloch, should by right have gained for him much of the credit ascribed to Laënnec, for he anticipated that great Frenchman by forty-eight years in the conception of "the unity of phthisis"; though he appears to have performed no more than ten necropsies on cases of pulmonary tuberculosis, he was an incomparable observer, and very possibly was the first to describe aneurysms on the branches of the pulmonary artery. There is also an appreciative sketch of the life of William Budd of North Tawton, with a reproduction of his far-seeing "Memorandum on the Nature and Propagation of Phthisis," which he kept back for ten years, in order to be sure of his ground. Sir James Fowler's opinion about the influence of heredity in pulmonary tuberculosis is to the effect that the problem is so surrounded with difficulties in the collection of accurate data that the attempt to form a scientific estimate is doomed to failure. A welcome feature, though unusual in such authoritative treatises, is the solution of a debatable point by an imaginary duologue, as in that between the pathologist and the tubercle bacillus on the reasons why tuberculosis begins near the apex and more often in the left lung, and in that on some practical questions in connexion with the spread of infection.

On the basis of his own and Dr. S. Martin's *post-mortem* experience at the Middlesex Hospital, fortified by Sir John Rose Bradford's recent figures respecting British soldiers in France, Sir James concludes that obsolete lesions in the lungs are found in 9 per cent., and contrasts this with the generally accepted opinion that latent tuberculosis is present in 90 per cent. of human bodies; to explain this wide discrepancy we may point out that one group of figures refers to the lungs and the other to the body as a whole, and that recent observations, such as those of E. L. Opie, show how easily small tuberculous glands along the bronchi may escape detection. The term paratuberculosis is suggested—on the analogy of paratyphoid—for bovine tuberculosis, but as the latter term is now thoroughly established and free from any ambiguity, and as paratuberculous has been employed in another sense—namely, with a significance like that originally attached to parasyphilitic—the advantage of such a change is problematic. Hilum tuberculosis is described as "a shadow seen in a darkened room but not yet clearly recognized in the daylight of the *post-mortem* room"; there is, however, a special chapter on tuberculous disease of the intrathoracic lymphatic glands, though without any mention or criticism of Krönig's areas. The terms "open" and "closed" as applied to tuberculosis are viewed adversely. The vast and therefore difficult subject of chronic pulmonary tuberculosis receives a well-balanced account; Sir James Fowler states that he has not seen a single case of pulmonary tuberculosis in which he could satisfy himself that any good had been done, and he has seen many in which any chance of recovery that they might have possessed has been destroyed by the administration of tuberculin; and of the diagnostic tuberculin tests he remarks that "when reliable the use of these tests is fraught with grave danger, and that when not fraught with grave danger they are unreliable." The chapter on sanatorium treatment, of which a high opinion is expressed, is dedicated to the memory of Otto Walther; and artificial pneumothorax is regarded as the only advance in treatment since the introduction of sanatorium methods as carried out at Nordrach. The last chapter consists of attractive *obiter dicta*, from which we will quote only two: the "lesions of pulmonary tuberculosis do not 'open' and 'close' like a mollusc," and "No fool is ever cured of tuberculosis of the lungs."

In conclusion, this remarkable book is admirable alike for its style and its matter, and though all may not agree with its outspoken opinions there will be few who will not feel that they must read it, and they may be assured that they will do so with advantage.

[1] *Pulmonary Tuberculosis.* By Sir James Kingston Fowler, K.C.V.O., C.M.G., M.A., M.D., F.R.C.P. London: Macmillan and Co. 1921. (Demy 8vo, pp. 298; 52 illustrations. Price 20s. net.)

POLYCYTHAEMIA AND ERYTHRAEMIA.

Dr. Parkes Weber's exhaustive monograph on *Polycythaemia, Erythrocytosis and Erythraemia (Vaquez-Osler's Disease)*[2] is an expansion of his critical review of 49 pages in the *Quarterly Journal of Medicine* for October, 1908, and contains a supplement epitomizing fresh literature mostly published since 1908, together with notes on unpublished cases, and, finally, concluding remarks and a note on the terminology; these additions include a paper published in our columns a year ago (October 30th, 1920, p. 658). Polycythaemia rubra, or for short polycythaemia, signifies an increase in the number of the red blood corpuscles, and is divided into two forms, which correspond respectively to leucocytosis and leukaemia in the case of the white blood corpuscles—namely, (1) erythrocytosis, in which the increase of cells is secondary to some definite factor, such as concentration of the blood by diarrhoea, vomiting or sweating, or compensatory as in the polycythaemia of high altitudes, and in cardiac or pulmonary disease with cyanosis; and (2) erythraemia, in which a well-marked persistent relative and absolute increase in the number of red blood corpuscles is due to a primary disorder of the erythroblastic tissue in the red marrow of bone and so analogous to the leucoblastic activity in leukaemia. This is the condition originally described in 1892 by Professor H. Vaquez of Paris and brought more prominently to our notice by the late Sir William Osler in 1903 and 1904. Although the spleen is nearly always enlarged, Dr. Weber considers that the synonym splenomegalic polycythaemia should only be used in a clinical sense—that is to say, as signifying a symptom-group composed of polycythaemia not obviously secondary to blood stasis and of splenomegaly for which no local cause, such as thrombosis of the portal or splenic vein, is suspected, for necropsy may show that the splenic enlargement is due to some definite lesion, such as syphilis or tuberculosis, and the associated polycythaemia may be due to blood stasis, and so not true erythraemia. The cases described by Geisböck as polycythaemia hypertonica appear to Dr. Parkes Weber to be examples of secondary polycythaemia in some way or other intimately connected with high arterial blood pressure. Though he insists at length on the forms of secondary polycythaemia, Dr. Parkes Weber joins issue with Professor A. S. Warthin's contentions that erythraemia is always secondary, and that Ayerza's disease, or cyanosis with secondary polycythaemia due to arteriosclerosis of the pulmonary artery, is usually due to syphilis.

This valuable monograph is a model of critical clinical

[2] *Polycythaemia, Erythrocytosis and Erythraemia (Vaquez-Osler Disease).* By F. Parkes Weber, M.A., M.D., F.R.C.P. London: H. K. Lewis and Co., Ltd. 1921. (Cr. 4to, pp. 156; 1 figure. Price 21s. net.)

and literary research in which every point receives a full share of bibliographical reference; but in addition the author's own views are clearly set forth and supported by sound reasoning. This, of course, is precisely what everyone who knows his work would expect from Dr. Parkes Weber, but he is to be congratulated on thus adding to his high reputation by supplying a work that must long remain the standard source of reference on this subject.

ELECTROLOGY AND RADIOLOGY.

THE thirty-first volume of the series *Traité de Pathologie Médicale et de Thérapeutique Appliquée*, published under the direction of Drs. SERGENT. RIBADEAU-DUMAS, and BABONNEIX, is on electrology,[3] and is the work of Drs. DELHERM and LAQUERRIÈRE. Their main object is to provide practitioners of medicine who are not familiar with the employment of electro-therapeutic measures with a book from which they can learn the general methods adopted by specialists in the treatment, by electrical means, of medical disorders, and also obtain information as to the methods of electro-diagnosis. The surgical uses of electrical currents are not included. As is usual with books of this description, the first part deals with generalities and with the various types of electricity used in medicine, such as the galvanic, faradic, static, high-frequency, and so on; its illustrations follow the usual conventional lines. The second part takes in order maladies of nutrition, of the skin, of the circulatory, the digestive, and nervous systems, and diseases of the genito-urinary organs; by far the larger portion is taken up, as might be expected, with the nervous system, from the points of view of both treatment and diagnosis. The final chapter is on the dangers of electrical currents and the precautions which should be taken. Although the book does not contain anything particularly novel, the whole subject is treated in a manner quite up to date and according to the most modern ideas; moreover, there is not so much padding as is usually to be found in textbooks upon this subject. It is well printed on excellent paper, the illustrations are of practical value and of good quality, and a good index renders reference an easy matter. Those who wish to be conversant with the present-day practice of electrical methods as carried out by the best French authorities will find it useful, and the price is moderate, especially in view of the rate of exchange.

The third edition of SINCLAIR TONSEY'S book entitled *Medical Electricity, Röntgen Rays, and Radium*[4]—it is true it also contains a chapter on photo-therapy—is such a stupendous volume and contains such an enormous amount of material that a review of it as a whole becomes a somewhat serious undertaking. Whether at the present time a book of this kind really repays the labour, time, and expense involved in its production is a matter of considerable doubt. It is not a book which one would like to take up with a view to reading through page by page its large and closely-printed pages, to the number of thirteen hundred; but as a book of reference, well indexed as it is, it should have its uses. The subjects of medical electricity, *x* rays—diagnostic and therapeutic—and radium have grown in the past twenty years or so to such an extent that an attempt to deal satisfactorily with them all in one volume is an almost impossible task, and, indeed, we doubt if it is a profitable one. There is more than enough material here to have warranted its division into three, if not four, separate volumes, and nothing would have been lost, but a considerable amount gained, by such an arrangement of its contents. Medical electricity especially is a subject which has hardly any connexion with radiology, and radium and *x*-ray therapy are quite distinct from *x*-ray diagnosis; here we have 654 pages of the former, 556 devoted to *x* rays, and 41 on radium. As compared with the two leading subjects, it is evident that radium has been squeezed into such a small space that the value of this chapter, even for the purposes of reference only, is very small; it should have been omitted. One point becomes very obvious as we glance over that part devoted to medical electricity and *x* rays—the author has been afraid to omit anything; there has been no attempt to cut down in any direction, and the amount of detail becomes somewhat overwhelming. There is nothing noteworthy in the part dealing with medical electricity, and practically nothing new; it is a compilation of all that is known on the subject put forward in the more or less usual manner, and illustrated with the usual pictures and diagrams. In the *x*-ray part, however, there is a certain originality, and many claims are made as to the designing of special pieces of apparatus, etc.; a study of the index shows two columns of references to the text to which the author has prefixed his own name. The illustrations and diagrams are numerous, and for the most part satisfactory—a few in colour are especially good. On the other hand, many of the radiographs are poor and do not adequately illustrate the points under consideration, whilst their reproduction leaves much to be desired; this is notably the case with those of the stomach after an opaque meal.

SUGGESTION AND AUTO-SUGGESTION.

Suggestion and Auto-Suggestion[5] is the English translation by EDEN and CEDAR PAUL, who have placed their readers under an obligation not only by the excellence of their rendering, but also by a useful preface, of Professor CHARLES BAUDOUIN'S psychological and pedagogical study based on the investigations of the new Nancy school under Coué. Thirty-five years ago there were two antagonistic schools of hypnotism in France: the school of the Salpêtrière in Paris with its dramatic results, led by the great personality of Charcot, taught that the phenomena of hypnotism were mainly, if not exclusively, morbid, or a neurosis, and the manifestations of major hysteria or hystero-epilepsy; on the other hand the Nancy school, founded by A. A. Liébault, a general practitioner, and expounded by H. Bernheim, professor of medicine, regarded hypnosis as a physiological state allied to normal sleep, which can be produced in anyone, and considered that the remarkable results obtained at the Salpêtrière were artificial and due to unconscious suggestion on the part of the operator. This old Nancy school founded the regular practice of suggestion, and its tenets have been so widely accepted that the interest of the pathological hypothesis of the Paris school is mainly historical. In 1913 Paul Emile Levy, a pupil of Bernheim, published *L'Education rationelle de la volonté*, which is transitional between the old Nancy school and the new. The new Nancy school has grown up under the guidance of Emile Coué, who has carried the work of his teacher, Liébault, further, so that he regards auto-suggestion as the powerful and widely diffused force of which hypnotic suggestion, the only form of suggestion hitherto consciously studied in medicine, is but one of many applications. Coué has written very little, less even than Liébault, and Baudouin, Professor at the Jean Jacques Rousseau Institute in Geneva, and more particularly interested in the psychological and educational aspects of the subject, now comes forward as the theoretical exponent of his teaching, and stands in much the same relation to him as Bernheim formerly did to Liébault.

In his introduction Professor Baudouin defines suggestion as "the subconscious realization of an idea," and contends that suggestion does not demand transference between the consciousness of the operator and that of the subject, and in fact that a "suggestor" is unnecessary. It is an active process going on inside the individual and starts from an idea; it is, moreover, distinct from instinct, habit, and will, the three usually recognized types of mental activity. The kinds of suggestion—spontaneous and reflective, which constitute auto-suggestion, and induced or hetero-suggestion—are discussed at length in the three parts of the volume. Auto-suggestion, in its spontaneous form, is an ordinary phenomenon of our mental life, and is as natural as emotion; it can therefore be trained in anyone, and must not be substituted for the will, but added to it. The organic control rendered possible by suggestion is thought to be the recovery of an ancient heritage which was lost during the course of evolution. Organic diseases have not generally been regarded as suit-

[3] *Electrologie.* By Drs. Delherm and Laquerrière. Paris: A. Maloine et Fils. 1921. (Demy 8vo, pp. 332; 153 figures. Fr.18.)

[4] *Medical Electricity, Röntgen Rays, and Radium.* By S. Tonsey, M.D. Third edition. Philadelphia and London: W. B. Saunders Company. 1921. (Roy. 8vo, pp. 1337; 860 figures; 16 plates. 50s. net.)

[5] *Suggestion and Auto-Suggestion.* A Psychological and Pedagogical Study based upon the Investigations made by the New Nancy School. By Charles Baudouin, Geneva. Translated from the French by Eden and Cedar Paul. London: George Allen and Unwin, Ltd. 1920. (Demy 8vo, pp. 288. 15s. net.)

able for treatment by suggestion, though it is true that Liébault sometimes employed them with this end in view; but examples are here quoted of the alleged cure of warts, uterine fibromyomas, and tuberculosis. Further, at the worst there are in every case of illness two elements: a primary factor due to the actual disease, and a secondary factor due to auto-suggestion; this secondary factor cannot but be influenced by suggestive treatment, and the inference is to the effect that suggestion can and should be tried in every case; thus a prescription should always be given, even if medicine is not absolutely necessary. Professor Baudouin insists that induced suggestion is so simple that it can be used by all parents and by all educationists for the benefit of their children and their pupils. It is only necessary to suggest the idea of cure, and the subconscious makes it its business to discover the physiological means for realizing the cure without either the operator or the subject having to know the nature of these means. For these reasons the educational applications of the new Nancy school are regarded as even more interesting and important than its therapeutic uses.

We have endeavoured to give an impartial account of the views Professor Baudouin expounds and, as we understand him, accepts. They seem worthy of consideration, but we must not be understood to subscribe to them.

VEGETABLE HISTOLOGY.

PROFESSOR C. W. BALLARD'S *Elements of Vegetable Histology*[6] is a manual intended to serve as an introduction to botanical microscopy for the beginner. The opening chapters deal in a very serviceable manner with the preparation of specimens and with the common types of microtome and the microscope. The last section is excellent in that it gives a really intelligible account of the optical principles of the microscope; moreover, terms frequently employed, such as "spherical and chromatic aberration," are clearly and concisely explained with the aid of simple diagrams. Very useful also are the chapters on the chemical reactions of plant tissues and on accessories to the microscope.

But the author has aimed further than writing a purely practical manual, for he has about a dozen chapters devoted to plant morphology. Here it seems to us that the text has suffered in the attempt to compress so much subject matter within so small a space. For instance, the structure of the plant cell and mitosis are discussed in four pages—with results that are decidedly sketchy. Again, the chapters on the various plant tissues are condensed to such an extent that the clearness of exposition has somewhat suffered. Terms such as "meristematic tissues," "bract," and "calyx," though very elementary, are introduced into the text with no accompanying explanation—which seems a pity, since the book is apparently intended for the beginner, who, as such, may be ignorant of the meaning of even the simplest botanical terms. There are several unfortunate misprints. In a discussion of the differences between animals and plants (p. 118) the word "plant" occurs instead of "animal." Also the English equivalent of the micron is the 1/25000 of an inch, and not 1/2500 as stated in the text. Though these are trifles they are none the less confusing to the beginner.

As a practical manual, however, this book should be of genuine value, especially to those interested in the botanical aspect of pharmacology, to which frequent reference is made in the text.

NOTES ON BOOKS.

MR. WIGHTMAN has produced a compact little book on *Home Nursing*,[7] containing a large amount of information. Hitherto very little has been written on this subject, and the brief references in manuals on first aid have been quite inadequate. The arrangement of Mr. Wightman's book is good, and he has taken the trouble to append an index. In the hope that the book may reach further editions, we offer a few criticisms. In the first place, the language is sometimes defective. In Chapter II, on respiration and ventilation, there is much poor writing, due perhaps to the difficulty of condensing such a subject with due consideration to lay intelligence. Under the heading "Effect of Remedies—Opium," the nurse is instructed to note carefully the size of the pupil, but she is not told why she should do so. In several matters there is a lack of definition, and some of the statements are debatable. Thus the airy way in which Mr. Wightman defines "epidemic," "endemic," and "zymotic" will surprise those who have attempted to place meanings on these difficult words. The statement that the "breathing powers of infants are, at the best, but feeble," would be contradicted vociferously by most healthy infants. The validity of "chill"—frequently mentioned—as a cause of disease is open to doubt; and is indigestion really a cause of earache in children? Defects such as these will no doubt be remedied under revision. In the meantime the little book should be very useful, and of great help to those called upon to nurse their friends or relatives.

In the preparation of Vol. II of the second and revised edition of *A Dictionary of Applied Chemistry*,[8] Sir EDWARD THORPE was assisted, we note, by some fifty-two chemical authorities, each of whom has initialled the section for which he is personally responsible. These sections cover all subjects falling in the alphabet between the words Calculi and Explosion. The comprehensive nature of the various articles may be indicated by a few figures; despite the succinctness of style appropriate to a book of the dictionary order, the article on disinfectants is, we find, some 20,000 words in length, and those on carbohydrates and chlorine are not far short of 40,000. As we observed in our review of Vol. I of this valuable reference book, it is as yet uncertain whether the whole work will necessitate six or seven volumes. In addition to the text there are numerous diagrams, tables, and illustrations.

Operative Dental Surgery,[9] by Mr. J. B. PARFITT, contains the substance of a course of lectures, and students of dentistry who read the book carefully will be well repaid. The author goes very carefully and thoroughly into the more important details of operative dental surgery, but many readers will be disposed to draw the unfortunate conclusion that if so much care, time, and detail are necessary for conservative dentistry, especially in relation to the treatment of "dead teeth" and the operation of crowning, it becomes a luxury to have it carried out. This may account for the many hopeless failures following these operations. It is better to advise the loss of the affected teeth if the treatment cannot be carried out efficiently. The chapter on the teeth of children is very short. The statement that "children are decidedly tolerant of septic trouble about their teeth" is not our experience. In the chapter on the operation of scaling the author states: "If there has been infection of the tissues beyond the reach of local applications," vaccine treatment is advised, but we fear it must be said that vaccine treatment is no cure for septic infection through the gums. The book contains many good illustrations, especially in the chapter on pulpless teeth and their treatment.

The aim of *Laboratories*,[10] by A. E. MUNBY, is to facilitate the construction of scientific institutes by bringing together both architect and scientist. There is a preliminary section on the "Scope and Inception of Building Schemes," in which the general principles to be kept in mind when planning the construction of a laboratory are clearly exposed. The author is above all a practical man, and the book abounds in suggestions for increasing the efficiency and comfort of laboratories. There are also special chapters dealing with the requirements of the various sciences. Of these, biology—under which heading Mr. Munby includes physiology—has the most bearing on medical teaching and research. This section not only deals with the general construction of laboratories, but also includes designs for such special requirements as physiological demonstration theatres, aquaria, and tanks for keeping amphibia. There is an amusing historical introduction by Sir Arthur Shipley containing interesting information about the earlier laboratories, much of which will certainly be new to most workers. The book is abundantly illustrated by excellent photographs and drawings, and should be of genuine value to all concerned with laboratory construction.

[6] *The Elements of Vegetable Histology*. By C. W. Ballard. New York: J. Wiley and Sons, Inc. London: Chapman and Hall, Ltd. 1921. (Post 8vo, pp. 260; 75 figures. 18s. net.)

[7] *Home Nursing Manual*. By C. F. Wightman, F.R.C.S.Eng. London: George Gill and Sons, Ltd. 1921. (4¼ × 5½, pp. 193; illustrated. 1s. 1½d.)

[8] *A Dictionary of Applied Chemistry*. By Sir Edward Thorpe, C.B., LL.D., F.R.S. Vol. II. Revised and enlarged edition. London: Longmans, Green, and Co. 1921. (Med. 8vo, pp. 723; 18 figures. 60s. net.)

[9] *Operative Dental Surgery*. By J. B. Parfitt, M.R.C.S., L.D.S. London: Edward Arnold and Co. 1921. (Demy 8vo, pp. 319; 108 figures. 21s. net.)

[10] *Laboratories, their Plannings and Fittings*. By A. E. Munby, M.A., F.R.I.B.A. With a historical introduction by Sir A. E. Shipley, G.B.E., Sc.D., LL.D., F.R.S. London: G. Bell and Sons, Ltd. 1921. (Cr. 8vo, pp. 235; 165 figures. 25s. net.)

OPENING OF THE WINTER SESSION.

PROFESSIONAL TRAINING.

Sir David Prain's Address to the Pharmaceutical Society.

The inaugural address before the Pharmaceutical Society of Great Britain, at the opening of the eightieth session of the School of Pharmacy, was given by Sir David Prain, F.R.S., M.B., Director of the Royal Botanic Gardens, Kew. The annual report was read by Dr. H. G. Greenish, who stated that for the coming year the school was quite full. The President, Mr. E. T. Neathercoat, presented the Pereira medal to Mr. D. Stephenson.

Sir David Prain began by saying that his excuse for giving a sessional address before the Pharmaceutical Society was that his work had led him to study the natural history of some of their materia, and that he had been much indebted to its members for assistance while so engaged. He asked to be regarded as one of themselves because his official duties had included the investigation of the sources of certain drugs and the actual production of others. A school of this kind was not made by the building which housed it, but by the training it imparted. Much of his official work during thirty-five years had been undertaken with the help of horticultural colleagues, trained in accordance with the policy so long observed by the Pharmaceutical Society. For sixteen years he had been closely associated with the training of student-gardeners in pure and applied science as a sequel to pupilage in the practice of their craft. This educational sequence led him to consider professional training in general. Critics to whom the practice of a craft was unfamiliar displayed a tendency to think of "practice" and "theory" as being antagonistic; but experts in particular vocations knew that, so far as their own work was concerned, conflict between "theory" and "practice" was impossible. Hence discussions on the relative merits of theory and practice, even when they failed to do good, did no real harm. Modifications in training necessary at different times, and variations in training possible at a given time, were best understood if actual cases were considered. Medicine afforded a good example of the one, husbandry of the other. Public opinion insisted that training in medicine should go hand in hand with training in surgery. Though the duties in the two arts might differ, the law ordained that before a neophyte could practise either he must be able to undertake both. The obligation to secure a double qualification involved complete professional training in the *fabrica* of surgery, the *institutes* of medicine, and the *materia* which both arts shared with pharmacy.

Originally practical pupilage was the recognized procedure. It worked fairly well. The surgical *fabrica*, before the advent of antiseptics, were patent to the eye; success in practice depended on caution and manipulative skill. The medical *institutes* consisted largely of physiological and pathological postulates, which might be memorized; success in practice rewarded natural sagacity and saving common sense. But pharmacy, which taught intending practitioners how their *materia* should be used, incidentally proved to them how desirable it was that they should possess some acquaintance with chemical principles and with the characters and qualities of living organisms. When the *institutes* of medicine, discarding clinical authority, initiated the methods of direct observation and controlled experiment, students soon discovered for themselves that they could not grasp the facts underlying those subjective conceptions of the normal and the irregular they were expected to master, without some knowledge of physics and some understanding of the structure and functions of vital mechanisms. Early journeymanship, originally spent at seats of learning discussing debatable questions and "wrangling" for degrees, was replaced by a system of "walking the hospitals." This developed into "a course of professional studies" which expanded at the expense of pupilage until the latter disappeared. Medicine found that professional training gave better results than the practical instruction of pupilage, but that the opportunities for education, as contrasted with instruction, which pupilage afforded, could not be provided during a course of professional study. More was needed than a widening of the scientific foundation on which sound professional training rests. In order to "kill two birds with one stone" the "training in pure science" which future practitioners ought to undergo was made a discipline distinct from the professional training which had to be imparted. The purpose was as sound as the theory on which it was based. But the extent to which it might be attained depended on the nature of the scientific discipline provided.

The suggestion that pharmacy should adopt this policy emanated from men of vision who foresaw a time when, in pharmacy too, pupilage might be only a memory. But while practical pupilage in pharmacy remained possible, the need for a preliminary "course in pure science" was not clear, and the policy long adopted by the Society seemed preferable. When pharmacy had to devise a new policy, she might do well to study, rather than copy, the example set by medicine. When instruction in pure science formed an integral part of professional study, the principles of a science taught might be illustrated by facts connected with the calling the pupil was to follow. This involved some duplication; these facts must be referred to again when the methods of practice were expounded. But such duplication had an educational value, for it enabled the same truth to be envisaged from different points of view. Where, however, instruction in pure science formed a prelude to professional training, this advantage largely disappeared. A decision had to be reached in advance whether scientific instruction be confined to the principles of a particular study or should include the presentment of its salient facts. No middle course was feasible. The needs of different callings varied; it was not uniformly necessary that the master of a profession be an all-round scientific expert. Thus medicine believed that if her disciples could master the principles of physics, chemistry, and biology before professional training began, they might acquire familiarity with the special truths of each that bore on future practice, while being disciplined in the medical institutes. If this were true of those who practised medicine, it must also be true of competent teachers of medical practice. But it could not apply to those who taught the institutes; such teachers, whether on the physiological or the pathological side, must be fully versed in physics, chemistry, and biology. Yet teachers of the institutes of any art should, like teachers of its practice, be recruited from among those who had studied that art and knew its needs.

When the institutes of medicine merely embodied the philosophical conclusions of clinical experience no difficulty arose; now that they derived their inspiration directly from physics, chemistry, and biology, it was desirable that some who studied medicine at a given time should have made themselves as fully acquainted with the facts as with the principles of these sciences before beginning their professional course. In some medical schools the proportion of students who had undergone this intensive training in pure science was steadily increasing, but their presence was due to idiosyncrasy and not to reasoned medical policy. Some who found the physiological side of the institutes of medicine specially attractive showed a tendency to omit the study of practice and to refrain from seeking a medical qualification. This, however, was not from lack of interest in the diagnosis and treatment of disease; much recent progress in both was due to the institutes rather than the practice of medicine. Some noteworthy advances had emanated directly from those pure sciences on which physiology and pathology depended.

Sir David Prain then touched on the beginnings of medicine and pharmacy and their relationship with husbandry among primitive peoples. When her hands were not tied by public opinion husbandry showed her firm belief that the best way to prevent sickness was to destroy disease. Early civilization, unable to follow the advice of husbandry or to depend on that of pharmacy, was led to invent medicine—an art "directed first to the prevention of diseases and afterwards to their cure." Limited to offensive tactics, the new art at first hardly appreciated the strategy to which her evolution was indirectly due. With tireless zeal and courage medicine in the field of practice had striven for four millennia to prevent sickness on defensive lines, but now she had at last adopted the tactics of husbandry, and in passing from the defensive to a vigorous offensive she now tried to abolish disease. For this task pharmacy still had to supply the necessary materia; hence the friendly relationship between the new calling and the old. Pharmacy wisely concentrated her attention on the "qualities" of the materia, leaving medicine to study their "uses." On this scientific basis the respective responsibilities of the two professions towards their common materia were at present clearly defined.

In callings like pharmacy or garden craft there were, or might be, at least four distinct types of training: there might be practical pupilage alone; or there might be a training in pure science (1) as a prelude, (2) as a complement, or

(3) as a supplement to practical pupilage. The part which pupilage unaided might play in the formation of character was perhaps less appreciated now than it once was. Its first aim was, by means of instruction and supervision, to make a pupil expert in his vocation; but where supervision was thorough the pupil underwent education as well. Were this not so, pupilage might be almost as valueless as attendance at a school where games were forbidden. The system of education now prescribed had to subserve preparation for examination. Teachers, through no fault of their own, were largely limited to the task of imparting instruction, and the education their pupils obtained was merely acquired unconsciously while at play. That the instruction given was good did not alter the fact that when examinations must be prepared for education suffered.

The lecturer then balanced the advantages and disadvantages of (i) a training in pure science that preceded practical instruction; (ii) a training in pure science that went hand-in-hand with practical instruction; and (iii) a training in pure science that followed practical pupilage. The first arrangement might be useful, but it was not always valuable; the second violated the axiom that it was usually best to do one thing at a time; the third was not a course of instruction at all, but was throughout a process of education, full of pleasure and interest alike to teacher and taught. But, whatever the method of training that prepared a man to follow his calling, he must not conclude, when the course was over, that his training was then at an end; in a sense it might be said that only then did real training begin. The facts of life were inexorable; their lessons could not be evaded; we must all educate ourselves to accept them. But education could be carried further than this, for it was not what facts brought home to a man but what he could extract from them that really counted.

CHARING CROSS HOSPITAL MEDICAL SCHOOL.

At Charing Cross Hospital, on October 5th, the prizes and certificates awarded during the winter and summer sessions of the medical school were distributed by Sir Frederick Mott, the chair being taken by Sir Herbert Waterhouse, senior surgeon to the hospital. The Dean of the school (Dr. Fenton) reported that there was continued evidence of solid progress. The number of students was about 200. Ten men and four women qualified last year. The whole resources of both school and hospital were open equally to men and to women, and the system adopted allowed of no sex distinction.

Sir Frederick Mott, in the course of his address, said he had often thought that if he had the opportunity of again teaching physiology he would, especially in the light of the experience of the last eight years, give a special attention to the influence of the mind on the body, and of the body on the mind. It had always seemed to him that doctors had neglected this branch of medicine too much, and the consequence had been Christian Science, faith healing, neuro-induction, and other modes of inspiring faith. It was true, as Charcot said, *C'est la foi qui sauve, ou qui guérit*, in the case of the functional neuroses. Before the war it was thought that the neuropathic tendency occurred seldom in men, as compared with women, but the formation of a conscript army, in which only physical disabilities were recognized as causes of unfitness, had shown that a large percentage of men were neuropathic and liable to these neuroses, hysteria, and neurasthenia, provided the stress was sufficient to excite their onset. Why was it that physiologists, with few notable exceptions, had ignored psychology, and psychologists had ignored physiology? It was because academic psychology was mainly introspective and metaphysical. There was no mind without memory, and no memory without body. All psychic processes were subordinate to physiological processes. All human activities had their primal instincts common to men and animals—namely, self-preservation, preservation of the species, and the instinct of the herd. The physiological experiments of Pavlov, of Canon, of Elliot, and of Crile, together with the progress made in our knowledge of the endocrine and reproductive organs in relation to the autonomic nervous system, showed the important influence of the body on the development and functions of the mind. The neuroses and psychoses were intimately connected with the function of reproduction, for there was a special tendency for these functional disorders and diseases of the mind to manifest themselves when the sex instinct matured and waned. There was no doubt that in adolescence, when the reproductive organs were becoming mature, a new source of psychic force connected with the primal instinct of propagation arose which produced a complete mental revolution. The energy of the sex instinct might undergo sublimation or diversion into other channels, and he agreed entirely with McDougall in the acceptance of the general truth of the Freudian doctrine, without committal to any of the other doctrines of the sex instinct of Freud. He was of opinion that the sex instinct, serving as the great source of psychic energy, was a fundamental principle of biological psychology, and the researches which he had been carrying on for many years upon the reproductive organs in normal and insane persons, especially the subjects of dementia praecox, supported this conclusion, and explained why the biogenetic psychoses came on in adolescence and at the climacteric periods of life. The psychology of dreams had during the war shown us what an important part they played in disclosing past experiences. A sign of convalescence in neurasthenia, amongst the soldiers, was the cessation of terrifying dreams. The wise practitioner, when examining a patient, would remember that the patient was carefully watching every shade of expression on his countenance, and though he might feel anxious he would never show it. Sir Frederick Mott having spoken of the herd instinct, and of the great service rendered by those courageous men who thought and acted differently from the herd, added a few words with regard to the neglect of medical psychology. The law required all medical practitioners to diagnose all forms of mental disease. How could this be effected? The question arose whether a short course of lectures on biological psychology should not form part of a student's teaching in physiology, or whether it should form part of the instruction in mental diseases. That he should know it was certain. If he had to teach physiology again he would devote ten or more lectures to the elements of mental physiology. He doubted, however, whether teachers in physiology would agree, for he found an admirable textbook, *The Physiology of the Emotions*, dismissed it in two lines with the plea that the subject was mainly speculative, although the practical physician was aware of its importance. After all, they wanted students to be taught the foundations of human life in order that they might be applied to the practice of medicine.

A vote of thanks to Sir Frederick Mott, proposed by Dr. Amand Routh and seconded by Dr. William Hunter, and a similar vote to the Chairman, proposed by Sir James Galloway and seconded by Mr. J. C. F. Tower, concluded the proceedings.

MIDDLESEX HOSPITAL MEDICAL SCHOOL.

The opening of the eighty-seventh winter session of the Middlesex Hospital Medical School took place at the Scala Theatre on October 4th, the Earl of Athlone presiding over a large attendance. Mr. G. Gordon-Taylor, O.B.E., F.R.C.S., delivered the introductory address, choosing as his subject "The dramatic side of surgery." Dramatic and spectacular surgery, he said, might be, and often was, the result of brilliant achievement. The extirpation of a large tumour commended itself at all times to the wonder and admiration of those who were less qualified to estimate the character of surgery, and it earned the gratitude and esteem of the patient. His late chief, Sir John Bland-Sutton, was a dramatic operator partly because of his speed. The few implements he required were in a tiny case that could be carried on one finger. Ultra-modern surgery was characterized by the employment of much special apparatus designed to facilitate the manipulation of less skilful surgeons, to improve results in dealing with malignant and other tumours, and to expedite and assist the more specialized forms of surgery. The terrific mortality of operations for the removal from the thoracic portion of the oesophagus of artificial teeth and other foreign bodies accidentally swallowed was well known to older surgeons: it had been completely altered since the introduction of the oesophagoscope. It was axiomatic that abdominal wounds involving several organs were attended with a heavier mortality than those which implicated a single viscus. This truth was still more applicable to simultaneous wounds of more than one body cavity. The results of

abdominal wounds operated upon by French surgeons during the war showed a recovery rate of some 50 per cent. if these cases were selected with some care. The statistics of abdomino-thoracic wounds in the early years of the war were gloomy reading, but out of 207 cases of this type operated upon in the Fourth Army in 1918, which he collected and analysed, 66.6 per cent. got well. The successful extraction of a stone by surgical means must be a somewhat dramatic event. That hospital had been closely associated with the history of calculus surgery. The perfecting of the cystoscope and its accessories had led to a change of attitude in respect of the surgical treatment of stones in the lower end of the ureter. He could recollect the thrill which he experienced some years ago when he enlarged the ureteric meatus with cystoscopic scissors and beheld the calculus, which he had watched with the *x* rays for some months, extruded into the bladder. The marked improvement in health which was consequent upon the surgical removal of portions of the digestive canal and its associated organs must impress the thoughtful with the wondrous compensating powers of nature. Patients who had been relieved of their gall bladder lived thereafter normal lives. In the treatment of chronic ulcer of the stomach, the pendulum had swung from the often unsatisfactory indirect attack by gastro-jejunostomy to direct operation upon the ulcer itself. Partial gastrectomy was now the operation of choice in this class of case. Men and women could live happy and healthy lives without the greater portion of their stomach. Surgery of the heart was naturally invested with dramatic splendour. The difficulty overcome in the removal of a rifle bullet by Pierre Duval from the intrapericardiac portion of the inferior vena cava was, to his mind, the most brilliant operation in surgery. Lastly, Mr. Gordon-Taylor gave several striking instances of dramatic surgery performed during the war, in dug-outs, and even in front line trenches.

The Dean of the School, Mr. A. E. Webb-Johnson, then presented the annual report. Special mention was made of an anonymous gift of £20,000 for the endowment of the chair of physiology. The school, it was reported, was continually making progress, and there were 640 students last year. Reference was made to the valued assistance rendered by old students of distinction, including Sir Richard Douglas Powell, Sir James Kingston Fowler, Sir Alfred Pearce Gould, Surgeon Rear Admiral Sir Percy Bassett-Smith, and Dr. William Wanklyn. The untiring efforts of Lord Athlone on behalf of the hospital were warmly recognized.

Sir John Bland-Sutton, consulting surgeon to the hospital, then presented the prizes to students and the Fardon Memorial Medals to the nurses. The customary votes of thanks concluded the proceedings.

MEDICAL SCHOOL DINNERS.

CHARING CROSS HOSPITAL.

The annual dinner of past and present students of Charing Cross Hospital was held on the evening of October 5th at the Adelaide Hall, Gatti's Restaurant. Sir James Galloway, senior physician, took the chair, and among those supporting him were the Principal of King's College, London; Professor Barclay Smith, Sir Frederick Mott, Dr. William Hunter; and the Vice-President and Treasurer of the hospital. After the toast of "Our Most Illustrious Doctor, His Majesty the King," had been honoured, the Chairman proposed "Prosperity to the Hospital and Medical School;" this was replied to by two of the students, Miss H. L. J. Wallace and Mr. W. H. Williams. The health of the guests was submitted by Dr. J. M. H. MacLeod, and responded to by Principal Ernest Barker, whose witty speech satisfied his hearers that, like Themistocles, "he was the best man of his time to improvise for the occasion." Sir Frederick Mott, who was called upon by the Chairman amidst great applause, also replied, and was persuaded to sing two good songs. The Chairman's health was proposed in very warm terms by Dr. W. C. Bosanquet, and the toast received with enthusiasm; Sir James Galloway's genial reply brought the formal proceedings to an end. Musical selections were given during the evening by performers from the Coliseum.

ST. MARY'S HOSPITAL.

The annual dinner of St. Mary's Hospital Medical School past and present students was held at the Connaught Rooms, London, on October 3rd. Dr. E. Graham Little, Physician to the Skin Department, presided, and proposed the toast of "The Hospital and the Medical School," to which Mr. A. R. Prideaux, chairman of the Committee of Management of the hospital, and Dr. C. M. Wilson, Dean of the Medical School, replied. The Chairman proposed the health of Sir William Willcox, in order to mark the distinction of K.C.I.E. lately conferred upon him; the toast was received with vociferous applause and musical honours. Mr. Zachary Cope, surgeon to the out-patients, proposed the toast of "The Chairman," which was also greeted with great applause. The attendance numbered 150, and included, amongst others, Sir Howard Frank and Sir Henry Lunn, guests of the chairman, and Sir Leonard Rogers.

UNIVERSITY COLLEGE HOSPITAL.

The annual dinner of past and present students of University College Hospital Medical School was held at Oddenino's Imperial Restaurant on Thursday, October 6th. The chair was taken by Dr. Henry D. Waugh, and over a hundred old students attended. The toast of "The Hospital and Medical School" was proposed by the Chairman and was responded to by the Dean, Dr. George Blacker. A very pleasant musical programme was supplied by Drs. Poynton, Leslie Williams, Somervell and Claremont, and the evening concluded with the toast of "The Chairman," proposed by Sir Rickman Godlee.

WESTMINSTER HOSPITAL.

The annual dinner of the Westminster Hospital past and present students was held at the Great Central Hotel on October 7th. Sir Charles Ryall, F.R.C.S., presided. The attendance numbered 101, including seven ladies. The Chairman proposed the toast of "The Hospital and Medical School," to which Dr. A. S. Woodwark, the Dean, replied, pointing out the successful development of the Medical School in its return to pre-war conditions, the present number of students being the largest for the past fifteen years. Mr. Arthur Evans proposed "The Past and Present Students," to which Surgeon Rear Admiral W. E. Axford, Lieut.-Colonel S. Scanlan, D.S.O., and Dr. Walter Baron replied, the latter expressing his pleasure, as a general practitioner, that the hospital was to remain in its present situation. Mr. Souttar also spoke on behalf of the present students, and referred to the exceptional teaching facilities provided. Mr. Rock Carling proposed "The Visitors," for whom Sir Murdoch Macdonald and Dr. Edwin Smith responded. Sir Edward Pearson, who has recently accepted the chairmanship of the hospital, and Mr. Gluckstein, the Mayor of Westminster, had accepted invitations but were prevented from attending. Mr. W. G. Spencer proposed the health of the Chairman.

The eleventh London Medical Exhibition, held last week at the Central Hall, Westminster, was considerably larger than that of 1920. Last year about ninety firms exhibited; this year the number was a hundred and twenty. Although no attempt had been made at grouping the exhibits in sections, from the point of view of attractive display the exhibition was certainly one of the best yet held, and much ingenuity was shown in the arrangement of the stands. The quality of the goods is, of course, the thing that matters, but a little additional effort to please the eye of the visitor is never wasted. Perhaps the most prominent feature this year was to be found in the *x*-ray department, for the apparatus shown represented recent advances in *x*-ray work, both for radiography and therapeutics, and there were some good specimens of instantaneous radiography. While Londoners had the opportunity of seeing much that was on view in the successful exhibition held last July in connexion with the Annual Meeting of the British Medical Association at Newcastle, there were one or two interesting exhibits which did not find their way north. It would be impossible to mention in a brief note the many new pharmaceutical preparations and the displays of food, instruments, and appliances encountered in a tour of two crowded halls; but in general it may be said that most of the well-known firms were represented, and the organizers of the exhibition are to be congratulated on their success.

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SATURDAY, OCTOBER 15TH, 1921.

NATIONAL DIETETICS.

It is scarcely four years since the energies of the ablest men of science and administrators were directed to solving the problem of feeding the nation, and were, indeed, almost concentrated upon it. It was believed, and rightly believed, that upon the accuracy of the answers given to the questions then asked the immediate destiny of the Empire depended. Correct answers were given to those urgent questions. The great administrator who understood the answers and based his action upon them is in his grave, hardly better remembered by the public than his scientific advisers. "The British nation," writes Dr. Corlette, "can never repay the debt it owes to these men. It has never tried to, and it does not know that it owes it. It has been allowed to think that the politicians, on whom the limelight falls, deserve the credit."

It is a commonplace that only an immediately impending calamity can command and retain the general interest of a whole nation. Looked at from the distance of 1,700 years, the conduct of those subjects of the later Empire whose light verses and even jests have come down to us, seems as indecently frivolous as that of the grave-digger in *Hamlet;* they were, as it seems to us, jesting on the brink of a precipice. We forget that no civilization breaks up like the wonderful one-horse shay, that a short time in the history of a nation is a very long time in that of its individual members living from hand to mouth. The twenty millions said to be now perishing of hunger in Russia do not seem to belong to the same order of events as the relatively slight increment of general misery in this country which has distinguished 1921 from 1920. Life here was only a little harder in 1920 than in 1919, and may not be much worse in 1922 than this year. We can all see the direction of movement, but the pace is not nearly sufficient to excite any public demand for a concentration upon the fundamental issues of existence, similar to that of 1917. Even our present rate of acceleration towards ruin could not bring us to the Russian pass for years. Inhabitants of another continent have towards ourselves some of the advantages of posterity, and it is not surprising that we should owe to the New South Wales Board of Trade the most recent and useful contribution to the literature of national dietetics. Of the three publications recently received,[1] Dr. Wardlaw's study of the food consumption of a series of university teachers and students is a good example of careful experimental work, and Professor H. G. Chapman's leaflet on food requirements contains as much information as can be compressed into two octavo pages. Dr. Corlette's monograph, *Food and Nutrition*, is, we think, the best presentation of the facts in a guise attractive to the ordinary citizen which we have yet seen.

Any medical man who has had to write or lecture on the subject of dietetics knows how hard it is to explain in non-technical language modern scientific ideas. Usually the lecturer ends by shirking some of the difficulties and taking refuge in platitude. Dr. Corlette has bravely faced all of them, even the portentous difficulty of specific dynamic actions, and, so far as we can see, has omitted little of real importance. His discussion of the influence of external conditions upon metabolism suffers from a lack of acquaintance with the recently published work of Professor Leonard Hill, and he has perhaps devoted undue space to the opinions of Professor A. L. Taylor, many of which seem to us to justify the comment Dr. Corlette makes upon one he does not quote ("it defies paraphrasing into easily understood language, but it contains nothing but what every physiologist knows"). These, however, are small points; as a whole the pamphlet is thoroughly efficient. Dr. Corlette has justly and vivaciously criticized some of the usual methods of inquiry; he points out that the process of computing "man values" has been carried too far. Obviously the wife of a blacksmith does not —*qua* wife of a blacksmith—need more food than the wife of a tailor; but if the same coefficients are used when reducing the consumption of a blacksmith's family to man values as when reducing the consumption of a tailor's family, we do reason falsely. This criticism affects the routine reduction of diets in any family groups the working members of which are engaged in more than "moderate" work, and does not appear to have been specifically admitted by other writers. Undoubtedly the method of calculation used by the Food Committee of the Royal Society, by which the reduction coefficients are only applied to the basal fraction of metabolism, should be adopted in important cases.

Dr. Corlette is generally in favour of a low protein ration, and holds that, for Australians, 80 grams of protein, including only 50 of animal protein, are an ample supply. He also thinks that the conventional energy standard of 3,500 calories for moderate work is too high. In order to determine the allowance to be made for differences of climate, Dr. Corlette has computed the amount of heat required to warm the respired air and saturate it with moisture at different external temperatures, estimating the total volume of air breathed from Haldane and Douglas's results. This, as we have hinted above, is probably too summary a way of dealing with the climatological factor. However, it leads to the conclusion that the inhabitants of Sydney would need some 200 calories a head a day less than the North Americans whose diet furnished Atwater's standard.

Dr. Corlette's remarks upon food economics in detail are of local application (in Sydney, potatoes and bread are at the same price per pound, so that potato calories are five times and potato protein ten times as dear as bread calories or protein), but in principle are of importance to us all. His report ends with these words: "Last, and by no means least, *acquire knowledge*, real knowledge. Serious research work needs to be done, and it is worth doing at almost any cost. There are many questions to be answered as regards the metabolism of people in New South Wales."

There is an even larger number of questions to be answered respecting the metabolism of people in England and Wales. Some of these questions are being answered; the work done under the auspices of the Medical Research Council on accessory food

[1] *A Preliminary Inquiry into the Diet of Australians*, by H. S. Halcro Wardlaw, D.Sc.; pp. 11. *Food Requirements*, by Professor H. G. Chapman; pp. 2. *Food and Nutrition, including an Examination of the Climatic Factor*, by C. E. Corlette, M.D., Ch.M., D.P.H.; pp. 71. (Sydney, 1921, Government Printer.)

factors has already earned a high rate of interest upon the public money expended, if to save life and diminish suffering can be given a money equivalent. But a great many other questions are not being answered at all. Many of the inhabitants of these islands are at the present moment insufficiently nourished, and within the next few months many more will become physiologically inefficient. There seems to be a difference of opinion amongst the economically learned as to the etiology of the disease. According to some sages it is Bolshevism, according to others profiteering, while many affirm that the salaries of bureaucrats are the efficient cause. However this may be, the prognosis is certain—namely, that the real wages of *all* classes, bureaucrats and others, must fall. It follows that the 60 per cent. of expenditure which, in the handworking classes, is the fraction normally devoted to the purchase of food, must be used more wisely than ever before if even the present level of efficiency is to be maintained.

We already know enough to give good advice upon many points, but there are many others, and these not the least important, which must be elucidated by further scientific research. In the work of Dr. Plimmer, which we recently noticed, mention was made of certain practically important unsolved biochemical problems. To the statistico-physiological facts respecting the sufficiency of diets taken by persons variously employed which physiologists and statisticians on war work collected, few *post-bellum* additions have been made. Professor Cathcart and his co-workers may properly be said to have solved the problem of the soldier as an energy transformer; we must still attempt to answer similar questions as to the civilian labourer on the faith of budgetary statistics, which, with Dr. Corlette, we think are wholly insufficient guides, and the quest for precise experimental data carries us at present into the remote perspective of Helsingfors. The Food (War) Committee of the Royal Society in 1919 based their calculations upon the accurate but limited inquiries of Becker and Hämäläinen and remarked, "the above report shows how very inadequate is our present knowledge of the science of nutrition, and demonstrates the necessity of renewed investigations of almost every point discussed in it."

Should economic conditions become just a little worse and the question again be asked, "What is a sufficient diet for a labourer doing such and such work?" we should be in precisely the same position as in 1919; no experimental measurements which command the general assent of the physiologists who have attended to the subject have been added to what we knew then. We have not even got together a representative collection of food budgets. We know that to obtain such knowledge costs money; we also know that, for the psychological reasons mentioned above, any expenditure of the sort would fail to secure popular approval. With that we have nothing to do, but it is our business to point out that the nation is entering upon what may be a long campaign against starvation without an adequate intelligence service. It does not even know it needs an intelligence service. There is still no such thing as a rational public opinion upon dietetics; idle chatter in the newspapers about vitamins or jokes about calories and medical fads are its equivalent. To create a sane public opinion will be a difficult task and may be achieved too late. The medical profession can, however, do something and will, we are certain, inculcate the lesson that the food problem is almost as urgent now as it was four years ago.

REACTIONS AFTER SALVARSAN.

In an article based on 9,000 cases treated during six years in the syphilis department of the Johns Hopkins Hospital, Baltimore, and in private practice, Moore and Keidel[1] give particulars of the cases in which dermatitis and allied reactions followed salvarsan. They distinguish two groups—mild and severe; in the former salvarsan injections may be continued, but in the latter grave blood changes occur, and treatment by salvarsan must be given up. Eighteen of their patients manifested grave reactions which contraindicate repetition of at any rate the same salvarsan preparation, and four had mild reactions—namely, urticaria, erythema, or facial herpes—which do not contraindicate further salvarsan injections, as this hypersensitiveness is soon lost. Urticaria appears soon after the injection, is transient, and, except that it may be associated with vasomotor nitritoid crises, is not accompanied by constitutional symptoms; it can be completely controlled by the intramuscular injection of epinephrin, or prevented by its preliminary injection. On the other hand, emphasis is laid on the danger of repeating a salvarsan injection if itching, or even a mild macular, maculo-papular, or vesicular eruption has occurred. No salvarsan product employed was free from the liability to be followed by reactions, and as a rule there was not any tendency for cutaneous manifestations to occur more frequently after large than after small doses; in less than one-fifth of the cases showing reactions was any drug other than salvarsan given; this point is important, as otherwise mercury might be incriminated as a factor in the causation of some of the reactions, especially stomatitis.

The group of grave skin reactions include macular, maculo-papular, vesicular rashes and exfoliative dermatitis, these being merely degrees of the same process. They appear from one to fourteen days after injection of salvarsan. Exfoliative dermatitis may be accompanied by conjunctivitis and diarrhoea, or by the graver complications of arsenical neuritis, jaundice, skin infection, bronchopneumonia, and nephritis. Out of ten deaths from salvarsan at the Johns Hopkins Hospital five were from dermatitis, and it is noteworthy that haemorrhagic encephalitis is almost unknown in America. Among Moore and Keidel's eighteen cases of grave reactions three had mild jaundice and nine skin infections, two of which proved fatal from streptococcic septicaemia. Bronchopneumonia follows denudation of the bronchial epithelium, and is favoured by the lowered resistance due to the direct action of arsenic on the bone marrow, as shown by the blood picture to be mentioned below. Thirteen out of these eighteen patients had fever ranging from 100° to 105° F., and more than three-quarters of them albumin and casts in the urine, two proving fatal.

The blood changes, on which little has previously been written, are not due to the skin lesions, but, on the contrary, favour their occurrence; these are leucopenia with diminution in the polymorphonuclear neutrophils, eosinophilia, increase in the number of the large mononuclear transitional group, and the appearance of many fragile cells. In the mildest cases the stimulating effect of arsenic on the bone marrow causes eosinophilia only, whereas in the most severe cases aplastic anaemia may result. The eosinophilia, though previously regarded as secondary to the dermatitis, is not really so, as it may occur in its absence. Under the heading "Allied reactions" are included two other grave manifestations—namely,

[1] J. E. Moore and A. Keidel, *Arch. Int. Med.*, Chicago, 1921, xxvii, 716–747.

itching without any eruption, and stomatitis which is also accompanied by blood changes and may occur in the absence of mercurial medication. After discussing the following hypotheses—namely, damage to the blood-forming tissues, the cumulative effect of arsenic when its normal excretion is impaired, and hepatic damage—as to the cause of the grave reactions, the authors regard them as the expression of anaphylaxis. The prognosis of the exfoliative dermatitis cases is bad; but there is evidence that although the sensitiveness of the patient to a salvarsan preparation causing a severe reaction persists for a long time and is brought out by even small doses, some such patients, who unfortunately cannot be accurately recognized beforehand, can tolerate another form of salvarsan preparation, which, however, should be tried with great caution.

THE INSURANCE CAPITATION FEE.

THE Minister of Health met the Insurance Acts Committee of the British Medical Association on the afternoon of Tuesday, October 11th, and informed the members that it was his intention, acting on the Government's decision, and after full consideration, to reduce the present capitation fee paid to insurance practitioners, which by arbitration was fixed at 11s. in March, 1920, to 9s. 6d. as from December 31st. He considered this a reasonable and generous fee, and appealed to the patriotism of the profession to accept it in the present state of the finances of the country. The Committee having considered the matter in private, the Chairman, Dr. Brackenbury, informed Sir Alfred Mond that the statement would be placed before the Panel Conference on Thursday, October 20th. While the profession, he said, might for patriotic reasons be prepared to consider a reduction of the capitation fee, it must feel assured that there was no risk of any deterioration in the efficiency of the service; he feared that reduction of the fee might induce some medical practitioners now upon the panel, and those among the best, to retire from it; if this process continued the efficiency of the service must suffer. He therefore urged the Minister to reconsider the amount named—9s. 6d.; this, however, Sir Alfred Mond declined to do; the offer made was not, he said, one about which he was prepared to haggle. If it were not accepted the whole matter would have to be reopened; the result could not be foreseen, but might quite possibly be the offer of a lower figure. Sir Alfred Mond was accompanied by the Secretary of State for Scotland, who appeared fully to concur in the views he expressed. A full report of the proceedings is published in the SUPPLEMENT this week.

THE ARMY MEDICAL SERVICE SINCE THE ARMISTICE.

AT the meeting of the War Section of the Royal Society of Medicine on October 10th the new President, Sir John Goodwin, Director-General of the Army Medical Service, delivered his address from the chair, taking as his subject the Army Medical Service since the Armistice. Sir John Goodwin said that on the cessation of military operations in 1918 a period of reconstruction began, affecting every branch of the army. The matters which claimed first attention in the R.A.M.C. were: (1) the release as speedily as possible of temporary commissioned officers; (2) the closing of hospitals as beds became vacant; (3) the organization of a dental service for the army; (4) the revision of orders and regulations for war establishments, a task to be carried through while the experience of the war was still fresh in the mind; and (5) the reinstitution of classes of instruction for both officers and men. As for the difficulties which had to be overcome, the first of these was war-weariness; then the service suffered through the death or retirement of many most valuable officers; the stringent and urgent need for economy was continually impressed upon those in charge of administration; and another cause for anxious thought, though scarcely to be described as a difficulty, was the stream of questions and criticisms both in Parliament and in private. The greater part of the criticism was helpful, but some of it was destructive or ill-informed. One had to listen to every view, and to be prepared to discuss a matter from every possible aspect; but there came a time in the argument over any question when a principle was reached, and beyond this point there could be no further discussion. The first task was the release of officers for civil life, and from 13,000 at the time of the armistice the number had been steadily reduced to 1,400 without any breakdown. At the armistice the hospital beds, in round numbers, were distributed as follows: United Kingdom, 364,000; France, 156,000; Egypt, 48,000; Salonica, 42,000; Malta, 8,000; Italy, 9,000; Mesopotamia, 10,000; Northern Russia, 1,000 (nearly). In November, 1918, 578,000 patients were in the charge of the service. In the United Kingdom at the present day the number of hospital beds was under 8,000. With regard to the dental service, an Army Dental Corps had now been established, and there were more than sixty commissioned dental officers in the army. Committees had been formed to deal with the question of the amendment of orders and regulations, and in this connexion Sir John Goodwin paid a tribute to the work of the late Sir William Babtie. Another matter which had to be considered was the compilation of the official history of the war. The first volume of the general *Medical History of the War*, dealing with the medical services in the United Kingdom, garrisons overseas, and colonial expeditions, was now being bound for issue; and the second volume, dealing with medical services in France, would, it was hoped, be published in the first half of next year. The first volume on diseases of the war was almost ready, and other sections were well advanced in preparation. The first volume dealing with the hygiene of the war would be ready next year; the volume on pathology was further from completion, but ten subjects had been treated, and the MSS. were in hand. He thought it doubtful whether they would ever obtain complete statistics covering every period of the war and every area of operations. The re-education of officers and men was another task which had been taken in hand. The R.A.M. College at Millbank was reopened as an instructional centre. All the large provincial hospitals and infirmaries were approached and asked to offer facilities as regards clinical work to officers of the R.A.M.C. stationed in the vicinity, and the most cordial assent was given in every case. Three schools of hygiene were now doing excellently. Instruction and training in administration were also being carried out. The training of the non-commissioned officers and men of the R.A.M.C. was being attended to, and 400 had been trained and qualified as nursing orderlies, *x*-ray and laboratory attendants, and dispensers. More than 100 officers had passed through the post-graduate courses at Millbank, and 59 of them had passed as distinguished and had qualified as specialists in various subjects. Out of 30 officers who presented themselves for examination for the D.P.H., 27 had passed. Sir John Goodwin mentioned that the rank of major-general is now open to officers who specialize in pathology, hygiene, medicine, or surgery. The war museum had been the subject of an immense amount of correspondence, but it was felt that at the Royal College of Surgeons the pathological collection was in the best possible hands and in a place of most ready access. Sir John Goodwin concluded with a tribute to all the officers concerned in reconstruction, not only those more immediately associated with him at the War Office, but many junior officers who, although extremely war-weary, went through the post-graduate courses, doing in all cases well, and in many cases excellently. It was a matter for

congratulation that at the end of five years' war both officers and men should have set themselves wholeheartedly to the task of reconstructing the service. It was a revelation of national character, of happy augury for the future. Sir Anthony Bowlby, in proposing a vote of thanks, said that Sir John Goodwin took over the director-generalship at a time of great difficulty, when the German offensive in the west was at its worst, and when new military enterprises were being taken in hand in various parts of the world. Since the war he had had continually to be doing things which were unpopular, depriving people of appointments they wished to retain and refusing appointments to others who wished to receive them. Nevertheless he had accomplished his task with the utmost credit. The speaker referred to the war museum at the Royal College of Surgeons, and said that when it was displayed as they hoped to display it no country in the world would have so complete and valuable a collection. Sir George Makins, in seconding, recalled Sir John Goodwin's command of the 14th General Hospital at Wimereux—he had never seen a more happy hospital—and also the part he took in the small medical society connected therewith.

WOMEN AT CAMBRIDGE.

At a Congregation held on December 8th, 1920, the proposal for the admission of women students to full membership of the University of Cambridge was rejected by the Senate, 712 voting for it and 904 against. Subsequently the Senate, by a narrow majority, authorized a vote to be taken on June 16th, 1921, upon two alternative propositions for regulating the position of women students in the University. The Council of the Senate, however, decided to postpone the vote to October 20th on account of travelling difficulties at the earlier date. The first of the two proposals, known as Grace I, was brought forward by its supporters as a compromise, in that it "gives the women full degrees, but meets the most serious of the objections put forward to the proposals of last December." On the one hand, women students would be matriculated members of the University, all degrees and prizes and studentships would be open to them, and they would be eligible to be members of boards of studies, and for professorships, lectureships, and examinerships. On the other hand, they would be excluded from membership of the Senate and the electoral roll, the number of resident undergraduate women would be limited, and their discipline would be in the hands of a women's representative board. Further, the supporters of Grace I state that a proposal will be put forward to prevent a men's college from electing a woman as a Fellow or in any other way admitting a woman as a member. Although the proposals contained in the compromise do not meet their full wishes the representatives of the women's colleges support it and have pledged themselves not to appeal to the Royal Commission on Oxford and Cambridge Universities if it is carried. The second proposal, Grace II, would simply confer titular degrees by diploma, without other privileges, on duly qualified women students. It is put forward by its supporters as an equitable settlement, "conceding all that the women asked for in 1897," when a proposal to admit women to titles of degrees was rejected by 1,713 against 662 votes. To this proposal the women's colleges offer uncompromising opposition. At the Congregation next Thursday votes for both Graces will be accepted at the same time. In the event of Grace I being carried (even by a majority of one vote) Grace II will be withdrawn and the votes for it destroyed uncounted. The "battle of the fly-sheets" is now once more being waged. The supporters of Grace I claim that "it affords the only practical possibility of a constructive policy or of a policy with any respectable claim to be regarded as generous," and they add that "it is certain that the rejection of the present compromise will lead to decisive action by Parliament." The committee opposing Grace I, and supporting Grace II, hold that as the question of full membership of Cambridge University for women students was decisively rejected last December, it should not be reopened for a reasonable term of years. They argue that Grace I is an unwarranted attempt to go back on a decision already taken, that it involves an interference by women in the education of men, and that it is not, and cannot be, a permanent settlement. They profess to see little or no connexion between women's education and women's membership of the University. "They are willing to affix the same hallmark to ability and attainment and continue to the women the existing preferential treatment in the matter of fees, but they are not willing to be governed by women nor to have men's education modified in the interests of women." Lastly, in regard to the probable appeal to the Royal Commission by the authorities of Girton and Newnham, if Grace I is not passed, they hold "that as long as the government of the University is vested in the Senate it is the privilege and duty of each member thereof to vote as he thinks right." We have briefly attempted to state impartially the main arguments of the rival parties on the question the graduates of the University of Cambridge are called upon to decide next Thursday.

EARLY BOOKS ON LONDON HOSPITALS.

Of the lore relating to the old hospitals and medical societies of London Sir D'Arcy Power is a master; as his recent note on the bibliography of three sixteenth century English books connected with London hospitals is published in *The Library* (1921, ii, 73) and might otherwise miss the attention it deserves from colleagues, a brief reference to its scope is desirable. His paper, which was read before the Bibliographical Society, throws light on the history of three works of a bygone day. The first is "The Order of the Hospitalls of K. Henry the viiith and K. Edward vith, viz., St. Bartholomew's, Christ's, Bridewell, St. Thomas's." It is in black letter, without the name or place of the printer. It bears the date 1557, but as the result of much research Sir D'Arcy Power concludes that there was no edition in that year, and that the book was first printed between 1690 and 1700 from a manuscript, possibly at the expense of Samuel Pepys, who, as Secretary to the Admiralty, was keenly interested in the welfare of Christ's Hospital, which it had been intended should train officers for the king's ships. The reason for the belated printing of "The Order" was a determined effort of the Court of Aldermen in 1681 to regain their ancient jurisdiction over the four Royal Hospitals, which had practically lapsed from disuse. In his second bibliographical study on "A profitable treatise of the anatomie of man's body: compyled by that excellent chirurgion Thomas Vicary," Sir D'Arcy Power supplements the late Dr. J. F. Payne's critical examination (vide British Medical Journal, 1896, i, January 25th), which conclusively proved that this work was an abridgement of a manuscript by an unknown English surgeon in 1392; Sir D'Arcy also shows that his predecessor at St. Bartholomew's was no purloiner of other men's brains, but that the "Anatomie" was issued originally as part of a scheme to go back to old writers at a time when surgery was just beginning to take a new lease of life after the dead period of the Wars of the Roses. The third work, "The Ordre of the Hospital of S. Bartholomewes in West-Smythfielde in London," issued in 1552 in order to counteract an outcry against the governors, is described, with interesting extracts from its provisions, one of which directed that an unbroken record should be kept in the form of a Repertory, a book of Survey, a book of Accounts, and a Journal, and thus rendered possible Sir Norman Moore's recent monumental History of St. Bartholomew's Hospital.

PUBLIC HEALTH IN FRANCE.

IT is admitted that public health administration in France stands in need of improvement, and there has been much discussion of the subject during the last year or so. The principal Act by which it is at present governed came into force in February, 1902, but it has not produced the desired results. In fact, to say that it came into force is an exaggeration. The initiative was left to the central authority and its local representatives; if the prefect of a department was keen on matters of hygiene a good deal might be begun during his tenure of office, but when he ceased to hold office, unless his successor was like-minded, the apathy of the local authorities or the self-interest of their individual members brought the reforms to a standstill. In short, though not ostensibly permissive, the Act did not provide any adequate machinery for compelling local authorities to carry out its requirements. The Ministry of Hygiene recently issued a draft of a new law, in which it was proposed still further to increase the powers of the central authority. The draft was submitted to the Académie de Médecine for its opinion; after receiving a report from a special committee and discussing the matter on many occasions during the last two or three months, it has now issued a statement of general principles which, while it may seem to foreshadow a scheme that would according to British ideas be over-centralized, would yet permit a far wider application of the principle of devolution than was contemplated by the Ministry. The Académie recommends the establishment of a public health service the members of which, while responsible to the Minister of Hygiene for the carrying out of the public health laws, would at the same time act as advisers to the local authorities. The whole of France would be divided into sanitary areas (circonscriptions), each with a local medical officer of health (médecin sanitaire); the circonscription would be small enough to make it possible for the médecin sanitaire permanently to maintain close relations with the people, the medical profession, and the administrative authorities of the area. These sanitary areas would be grouped into sanitary regions, each with a regional medical inspector. The regions would be large in order to ensure that the inspector should be a highly trained and independent officer. Paris and other large cities, while retaining their municipal sanitary organization, would be subject to the control of a regional inspector. The local medical officers (the médecins sanitaires) of the areas would not be able to do more than recommend the administrative authorities to carry out the improvements they deemed necessary, but the hope would seem to be that the responsibility of the local medical officers, through the regional medical officers, to the Ministry, would ensure that action would be taken by the local administrative authorities. The Académie proposes that the new law should provide for the compulsory notification of infectious diseases to the médecin sanitaire both by the head of the family or institution and by the doctor; it would make revaccination against small-pox compulsory in the seventh, thirteenth, and the twentieth year, and, in exceptional circumstances, at any other age the prefect of the department might decree. In a final omnibus clause it is declared that the measures which ought to be adopted to combat transmissible diseases are vaccination or preventive immunization, isolation, disinfection, special precautions during epidemics, the protection of drinking-water supplies and of shellfish beds, the purification of sewage, and the adoption of what we should call in this country building by-laws. The methods of local government in France differ fundamentally from those which prevail in this country; we have, for instance, no officials comparable with the prefects and subprefects, and it is through the prefectorial system that sanitary administration has hitherto been conducted. It is therefore difficult for observers in this country to form any sound opinion upon the proposals now made in France. The experience of this country, however, is that sanitary administration cannot move far ahead of public opinion, and that education of the public must precede official attempts to apply improved methods. We suspect that in this matter human nature is very much the same in France.

SCIENTIFIC AND INDUSTRIAL RESEARCH.

THE work which has been carried out during the past year under the auspices of the Committee of the Privy Council for Scientific and Industrial Research is still largely a record of adjustment to new and unforeseen conditions. The wholesale destruction of life and wealth in the war gave place to a feverish demand for commodities which, after a brief space, has led to the present exhaustion and lassitude, and each phase has brought its own urgent difficulties. "It appears," says the Committee in its report,[1] "that the main directions for advance lie in higher efficiency, increased output, and greater economy. The tragic destruction of men and the enormous loss of wealth will enforce a reduction in output in every sphere in the national life unless a wise economy and an increased use of science can be made to counterbalance them." Scientific research is the main, if not the only, source of fresh productivity and industry, and it is only by increased production that the world will find a way out of its present difficulties. A promising beginning has been made in the task of co-ordinating research activities of the fighting services and the other Government departments, and research boards have been set up for this purpose and also to form a central finance authority for research of general, industrial, and scientific importance. These boards are also to act as a source of information on the results achieved and to arrange for researches for which no adequate provision is otherwise made. Preliminary investigations by the research boards have shown that in a strict sense there is remarkably little overlapping in the investigations conducted by the different services, and in many instances where the same problem was apparently being attacked at different establishments closer inquiry showed that it was being attacked from very different points of view. Considerable progress has been made with a scheme for co-operative research by the interested industries themselves, and a number of new research associations have been established during the past year in such industries as, for instance, the motor cycle trade, the cutlery trade, the music industries, and the silk industry. It is three years since the first research association was formed under the Government's scheme for industrial research, but even those associations which were first instituted can hardly be said to have had sufficient time to produce any large amount of new knowledge. Scientific research is inevitably slow in fruition, and the deeper the problems attacked the longer are the results likely to tarry; yet some of them have already done what will repay their expenditure. It would be a short-sighted policy to confine research organizations to a search for results of immediate commercial value. In a few instances, states the Committee, there is still a tendency to attach undue importance to early practical results, though the associations are concentrating their attention more and more on the fundamental principles underlying the methods and processes of their trades. The report includes the results of work which has been carried out by the British Cotton Industry Research Association, the British Research Association for the Woollen and Worsted Industries, the Linen Industry Research Association, the Research Association of British Rubber and Tyre Manufacturers, the British Photographic Research Association, the

[1] Report of the Committee of the Privy Council for Scientific and Industrial Research for the Year 1920-21. London: His Majesty's Stationery Office. 1921. Price 1s. net.

British Scientific Instrument Research Association, and the British Refractories Research Association, which show the many spheres of industry in which this valuable work is being done. Nor is this by any means the sum total of the work carried on under the directions of the Scientific and Industrial Research Committee. The Food Investigation Board, whose activities have been already noticed in our columns, is only one of many other different branches of its activity. Another is the National Physical Laboratory, which continues to increase in scope and importance, and has resumed the natural functions which were diverted into special channels during the war. The geological survey is carried out under the aegis of the Central Committee, and the Fuel Research Board has made for it a survey of British coal seams from the fuel point of view, and has conducted experiments on peat and on power alcohol. A special research board has been making important investigations into building materials and construction. The Physics, Chemistry, and Engineering Co-ordinating Research Boards have considered such subjects as the application of *x*-ray methods in the examination of materials, the production of formaldehyde, and the fatigue of materials, respectively. Investigations have been carried out on, for instance, the production of adhesives, oxygen and liquid air, the production of cylinders for the storage of gases, on the theory of the action of lubricants, and on tests for metal struts and spars for air craft. A committee was appointed to carry out the preliminary work necessary for investigating the flow of streams and tidal currents, as a beginning of a comprehensive survey of the water and water-power resources of Britain and of the Empire. At the British Museum fascinating research work has been successfully accomplished on technical problems connected with the preservation and restoration of antique objects, such as the prevention of damage to old drawings and engravings by moulds, and the removal of deposits of copper compounds from antique silver. In addition to the work carried out directly under the Scientific and Industrial Research Committee, grants have been made to certain universities and other independent institutions and to individual workers and students for specific researches, and the question has been considered—favourably, it may be hoped—whether State grants should not also be made to scientific societies to meet the increased cost of scientific publications. The total expenditure for the year was just over £552,000, of which some £373,000 came directly from the Exchequer; but, as the short review of the activities of the committee which we have given above shows, not the most ardent economist can deny that value is being received for money.

THE REASSEMBLING OF PARLIAMENT.

Our Lobby Correspondent writes: When Parliament adjourned in August until Tuesday next, October 18th, the hope was encouraged that the resumed meeting might be only formal—for the purpose of prorogation—unless Irish negotiations had sufficiently matured to enable a legislative settlement to be submitted. The adjournment was in fact regarded as a precautionary measure rather than necessary action for contingencies, as in any case Parliament could have been specially summoned. The unemployment situation has, however, altered the aspect of affairs. The whole position will come under review on a statement of the policy of the Government to meet the pressing circumstances, and one or more bills—probably several short measures—will be required to give the Government authority to carry out whatever proposals they may determine upon. How long these and other matters may take cannot be estimated off-hand, but the wish of the Whips is to get the prorogation by November 10th, as members have undertaken to address meetings in the provinces during the late autumn in pursuance of a Government campaign. Leading members of the Cabinet will also have severe calls upon their time in connexion with the Irish Conference, unless it should suddenly collapse, as is possible. The contemplated reduction in the payment to insurance doctors does not involve legislation, the remuneration being a matter of agreement between the Department and the profession. But it obviously can and may be brought before Parliament, as the Minister of Health is ultimately responsible to the House of Commons; if thought desirable, a day might be sought and obtained for discussion. It is fairly certain that there will be talk in Parliament on the 50 per cent. reduction made by Sir Alfred Mond in the grant from the Ministry of Health for the supply of milk to mothers and children under the maternity benefit provision, which is carried through by local authorities. It need scarcely be added that the department is not presenting, on its own initiative, any legislation on any subject in this short session, and there is little probability that any will be called for. Outside official circles, however, few persons familiar with parliamentary procedure are sanguine enough to think that once the session is re-started it can be stopped within three weeks.

Sir Marriott Cooke, K.B.E., M.B., and Dr. Sidney Coupland, F.R.C.P. (Consulting Physician to the Middlesex Hospital), have retired from their position as Commissioners of the Board of Control. Both were appointed Commissioners in Lunacy in 1898, and the former, who was previously Medical Superintendent of the Worcester County and City and the Wiltshire Asylums, acted during 1916–18 as Chairman of the Board.

As announced in our advertisement columns this week, the festival service of the Guild of St. Luke will be held in St. Paul's Cathedral on Tuesday next, October 18th (St. Luke's Day), at 7 p.m., when the preacher will be the Rev. Father Waggett. On this occasion the Guild is offering special thanksgiving for peace, and it is hoped that the congregation will be a large one. Academic dress will be worn. Tickets of admission can be obtained on application to the Rev. H. Kirkland-Whittaker, M.D., Chaplain's House, Banstead Downs, Sutton, Surrey, or to Mrs. Scharlieb, M.D., 149, Harley Street, W.

Demonstrations of specimens in the Museum of the Royal College of Surgeons of England will be given by Professor Shattock and Sir Arthur Keith in the theatre of the College on Mondays and Fridays at 5 p.m. from October 24th to November 11th. They are open to advanced students and medical practitioners.

A Chadwick Public Lecture on "Plant diseases and their relations to diseases in man" will be given by Professor V. H. Blackman, Sc.D., F.R.S., in the Lecture Room, Chelsea Physic Garden, S.W.3, on Thursday, October 20th, at 5.15 p.m. The chair will be taken by Sir William Collins, Chairman of the Chadwick Trustees. The gardens will be on view before the lecture.

Lieutenant-Colonel R. McCarrison, I.M.S., will give the Mary Scott Newbold Lecture before the College of Physicians, Philadelphia, on faulty food in relation to gastro-intestinal disorders, on November 11th, and the de Lamar Lecture before the School of Hygiene, Johns Hopkins University, on November 14th. On November 1st, at the Harvard Medical Society, Boston, he will speak on deficiency diseases and disturbances of internal secretion, and will address the Royal Canadian Institute on November 5th. On November 21st he will give the Hanna Lecture at the Western Reserve School of Medicine, Cleveland, on faulty food in relation to endocrine disorder; and the Mayo Foundation Lecture, at Rochester, Minnesota, on the etiology of goitre, with special relation to fats, on November 30th. He is to speak at the New York Pathological Society on November 9th, and at the Institute of Medicine, Chicago, on November 5th.

MOTOR NOTES FOR MEDICAL MEN.

BY H. MASSAC BUIST.

THE SHOW SEASON AND A YEAR'S DEVELOPMENT.

TWELVE months have passed since the last motor show season in Europe. Last year, in spite of difficulties with respect to labour and raw material, transport and coal troubles, the Society of Motor Manufacturers and Traders expanded its enterprise to an unprecedented extent by leasing the White City to supplement the accommodation at Olympia; whereas, by contrast, the French industry abandoned its projected show in the Grand Palais in October, and there was no exhibition in Berlin. This year there has been a complete change, the Germans opening the season last month with an exhibition which produced quite surprising results in respect of the trade done, particularly for export. The French industry is now holding the sixteenth of its twice interrupted series of yearly exhibitions in the Grand Palais, Paris. On November 4th the Society of Motor Manufacturers will open its motor car exhibition, under the patronage of the King, at Olympia, Kensington, and at the White City. Last year car prices were absurdly high, and relatively few firms introduced new models. This year nearly all firms will be introducing new models. Practically no firm in the world's industry will introduce a more powerful model; whereas the leading makers supplement their enterprise by the introduction of smaller cars. Prices are proportionately lower, and fuel costs have come down, though they are nothing like as low as they should be. Nevertheless, it is possible to buy petrol at just under 2s. 6d. a gallon for the lower grade, against the equivalent current price of approximately 4s. 2d. ruling at the moment in Paris. In this connexion, however, it must be pointed out that prices vary, not only from day to day, but also as between one centre of purchase and another throughout France; therefore it is almost impossible to give an exact idea of the situation beyond the fact that fuel costs very much more there than in this country. Moreover, apart altogether from the influence which the high cost of fuel had in causing makers to devote great attention to supplementary air devices for securing more economical fuel consumption, we find that the world's motor industry is learning also to gear its cars lower so as to give proportionately better performances in the case of small scale machines in the way of smarter hill climbing, quicker acceleration, as in traffic and so forth—of course, at the cost also of reducing the maximum possible rate of travel on the flat.

A YEAR OF THREE-SPEED CARS.

It has long been discovered that claims as to fast maximum rates of travel on the flat do not promote sales to nine potential purchasers out of ten, because we have long passed the period at which it first became possible to produce vehicles sufficiently fast for all reasonable purposes; whereas we have not anything like attained to the maximum degrees of acceleration the average motorist desires, as, for example, the doctor who has to use his car in the midst of traffic. The quicker a car can be accelerated the safer that vehicle is in traffic, because the more quickly can it be manœuvred out of an emergency. Again, time can be saved by prompt hill-climbing. That has been had in mind, particularly by the British industry, which has again led the way in the reduction of weight, and by the French industry in its new style cars, which are by comparison much more conventional but still quite notable vehicles. Yet this is a year of three-speed cars, from the twelve-cylinder Super Fiat of 40/60-h.p. to the new 5-h.p. Citroen two-seater cycle cars. The reason is that the new style gearing and the engine facilities now standardized makes possible this weight carrying. Incidentally the odd situation obtains that the country that alone profited by the war—the United States of America, whose national wealth was more than doubled by it—finds it practically impossible to export its cars to the Continent by reason of the exchanges; whereas the country that lost the war, Germany, has secured such vast orders, particularly for export, that her motor passenger-car building industry was never busier than to-day. Despite what might be held to be a prohibitive import duty and the luxury tax, the French industry is scared at the prospect of German competition, and the point is beginning to be realized in industrial circles in this country, too. Sensational types of German car development, such as the Rumpler, with engine in the stern and the control gear in the front, or of the freak exhibits in the Paris show, are of no more interest to medical men than are the vast number of cycle cars, and so-called light cars, introduced by the provincial French industry on the one hand, and on the other by firms more or less lacking post-war factory equipment in this country. Above all things, the medical man must have sound engineering work. The large engineering houses of the world now have every opportunity to produce in as great quantities as their order books justify them in embarking upon.

PEDIGREE VERSUS NONDESCRIPT CARS.

There is no lack of cars, nor is there any need to wait for delivery of them. Therefore medical men should buy what might be called pedigree cars, and take no risks in "here to-day and gone to-morrow" propositions. Importers of cars into this country and builders at home have alike announced their 1922 programmes early this autumn. Again, the lesson of this year's racing for the Blue Ribbon events, wherein really useful experimental work is done, is that the 3-litre types of engine, which before the war were called small cars or voiturettes, are now too big even for the large car class. This was first brought to light when Ballot ran a 2-litre engine car, now standardized and shown in the Grand Palais, in the 3-litre French Grand Prix Race, and attained a mean speed of 68½ miles an hour without sustaining the tyre trouble that handicapped the 3-litre engined vehicles. A few months afterwards, on the Brescia circuit in Italy, a team of four Bugatti cars, with 1½ litre engines only, put up remarkable speeds, the leading vehicle doing approximately 72 miles an hour on a course which is chosen for its absence of turns and relatively level and straight going. The culminating surprise of all, therefore, came when the French had their Voiturette Grand Prix Race, also for cars with 1½-litre engines only; it was run on the Le Mans circuit, which abounds in corners, variations of gradient and abrupt curves; therefore, instead of a car getting under way and running almost without check to the finishing post, it is tested in really useful fashion by being subjected to constant braking, changing of gear and acceleration. In those circumstances a team of three Talbot-Darracq cars that come under the 10-h.p. tax in this country carried the day, the winner achieving a mean speed of 72 miles an hour and thus utterly eclipsing the astonishing 2-litre performance earlier in the year which had led a number of Continental manufacturers to hit on that size of engine for standard cars, as witness the introduction by Belgium of the Minerva 2-litre double-sleeve valve-engined type; and by Panhard-Levassor, and others, of machines also coming within this category. Nor is the development without parallel in this country, as witness the introduction by Sunbeam of a nominal 14-h.p. 2-litre, four-cylinder overhead valve-engined car with three-speed gearbox.

It will be noticed incidentally that, alike on the Continent and in this country, whereas the three-speed gearbox was wont to be attacked as inadequate before the war, quite a number of firms are using the type in face of such successful practice over years by firms such as Rover with their 12-h.p. vehicle, and later with the two-cylinder 8-h.p. type, and on the other hand by Vickers's concern, Wolseley, with their nominal 15-h.p. four-cylinder and 10-h.p. four-cylinder overhead valve types. The fact is, modern engines can be made so flexible and efficient, while nevertheless coming under low Treasury ratings, that there is no occasion to incur extra weight and complication by fitting four speeds forward. Of course, if an engine has a narrow range of useful revolutions, the case is different. But there is no occasion nowadays to concern oneself with other than modern motor engineering practice.

A GUIDE TO CAR SELECTION.

The time of the London motor show is so close at hand that those medical men who have it in mind to purchase cars will find it pay them, unless they have individual reasons for having made their choices already, to await the opening of the exhibition in London in the first week of next month. There everything that matters on the world's motor market—and, alas! much that had better

never have been built—will be placed in convenient juxtaposition whereby type can be compared with type. Nor need the large number of exhibits worry the medical man in the least, in that, at most, twenty types will be all that will concern any individual. There is no need to concern oneself with shoddy stuff, or with material produced by other than the firms which have adequate production resources. Nor is there need for medical men to embark on experiments, as by acquiring a new model rushed on to the streets in frantic haste to have something ready for the show, as some firms are doing, in that some of the sound types which were new, and to some extent experimental, in the hands of the public twelve months ago have now been "tried out" by motor users in hundreds. As a result a number of lessons have been learnt and the necessary improvements have been incorporated in the vehicles in question, which are now on sale, moreover, at lower prices. Most of the leading manufacturers can tell the inquirer right away what are their prices for the 1922 season, in which connexion there have been appreciable reductions practically all round. In the case of non-wasting assets, which alone concern the medical man—by which I mean cars designed on post-war lines to suit post-war conditions—the reductions are less drastic than in the case of stocks that may be said to hang heavy on vendors' hands because there is no demand for them by reason of their old-style design. In the case of the most modern designs the reductions range from 10 per cent. to 12 per cent.; in which connexion it must be had in mind that such design invariably indicates that the given vehicle is likewise cheap as to taxation, maintenance, and running costs, being economical of tyre and fuel consumption. Vast improvements have been made in springing. Notably such developments as the 10-h.p. and the 15-h.p. Wolseley system have had much to do with reducing tyre wear. This finds an echo in some fresh French enterprise. Our neighbours, however, still largely use half elliptic springs for the rear suspension. But the British lead of the full cantilever is favoured by Renault, Berliet, Darracq, Fiat, and many others for their latest models.

The Scale of Price Reduction.

Some notion of the scale of price reduction in the case of proved and unproved types may be had from the fact that the two-cylinder, air-cooled, three-speed, worm-driven 8-h.p. Rover car, of ample body accommodation, has now been reduced to 230 guineas. There has been a corresponding reduction in the cost of the 12-h.p. water-cooled four-cylinder type. The 10-h.p. Wolseley (complete) specification two-seater is now retailed complete at £475, this being a type of vehicle that is as handy in traffic as it is surprising in hill climbing and speed performance in the open country; in this connexion it is to be borne in mind that it will give thirty-eight miles to the gallon touring across country in spirited fashion. Again, the 15-h.p. Wolseley chassis is reduced to £615. All these vehicles, moreover, are produced in improved form, as the result of a year's service in the hands of the public, the designs being so notably original and sound that they are being paid the compliment of very extensive imitation. In another direction progress may be illustrated by citing the introduction, by Daimler, of a four-cylinder, £20 tax, sleeve-valve engined chassis complete at £700, which is capable of accommodating the largest classes of covered coachwork for town service; by Armstrong-Siddeley of a new six-cylinder, overhead valve engined, £18 tax chassis at £575 only, the vehicle being furnished complete with saloon coachwork at £895; by Austin a 12-h.p. four-cylinder type to retail at about £550 complete; by Singer of a nominal 15-h.p. six-cylinder type; Sunbeam of three-speed, cantilever spring, 14-h.p. four-cylinder type with overhead valve engine; by Vauxhall of a nominal 14-h.p. side-valve four-cylinder engine car with three speeds forward at £750 the complete vehicle; by Talbot-Darracq of a 10-h.p. four-cylinder overhead valve engined type with cantilever rear suspension; by Standard of a smaller four-cylinder type than the already well-established model; by B.S.A. of a nominal 10-h.p. air-cooled 90° twin-engined, three-speed Lanchester-worm-driven small car to retail complete at £340; by Horstman of a 10-h.p. car of original construction; by Belsize of a Bradshaw designed nominal 9-h.p. air-cum-oil cooled twin-cylinder car to retail at about £300; and by Wolseley of a nominal 7-h.p. flat twin-cylinder, water-cooled, side-valve engined, three-speed, worm-driven, quarter-elliptic sprung two-seater car. Turning to the foreign industry we have, among approved undertakings, a series of remarkably low prices for 1922 in the case of Fiat. Among the new French types the 11-h.p. four-cylinder Delage, with side-valve engine, retails at a chassis price of £575 or as a four-seater complete at £725 in this country; the 10-h.p. four-seater Citroen has come down to £395; the new 5-h.p. 55 mm. bore by 89 mm. stroke four-cylinder two-seater Citroen, introduced at the Paris show, sells in France at the equivalent of £170; and so on. Panhard introduces the smallest sleeve-valve engine, a nominal 10-h.p. car of 1,187.51 c.cm.; Berliet a light 20-h.p. model; while Renault has a small 10-h.p. type and Voisin introduces a small 12-h.p. type as well as an 8-h.p. sleeve-valve type; and 10-h.p. models are brought forward by Peugeot, Delahaye, Rolland-Pilain, and Chenard-Walcker, among many other well-established car builders. In short, whether among proved models or new style cars by the principal makers there is no lack of choice; nor need there be any delay as to delivery.

How to Judge a Car and its Salesman.

Some medical men stand in need of advice as to how to judge a vehicle when he is being subjected to what Florio would style the "wordy wily beguilies" of the able salesman. For example, this is the period at which petrol and tyre economy—in other words, running costs—are of prime importance; therefore, no sooner does one vehicle possess some particular point of merit in this connexion than, of course, it is claimed for every other one. Thus, where good suspension resulting in lightness on tyres is claimed, it is well, when a car is being tried, to watch whether the tyres are flat. Often poor suspension is hidden by running demonstration vehicles with relatively soft tyres, which is the exact opposite of tyre economy. Again, the fuel consumptions claimed are usually quite impossible. Neither is an R.A.C. certificate much good in this connexion, because the routes chosen are probably not the type the given user has to traverse, apart from which the vehicle will be demonstrated in the hands of experts and specially tuned up.

The average medical man runs, as a rule, relatively a short distance between his cases, therefore his engine is always getting cooled. For this reason the air-cooled engine is, among the types on cheap cars, not an impossible proposition for him. Of course, it is easy to abuse an air-cooled engine, which may be defined as running it fast before a following wind. Even so, if it becomes overheated all that has to be done is to ease it for a spell. Moreover, British roads are so devious that it is rarely one runs quite away from the wind for more than a few minutes at a spell. Indeed, the troubles encountered by those who know how to manufacture air-cooled car engines are not so much in regard to cooling as to silencing. This is one of the reasons why the Rover car is so clever. It runs very quietly, and it does not hold out the lure of great speed. On the contrary, the maximum rate of travel of the vehicle is limited strictly. Yet it is adequate. The engine size shows that the whole structure is stressed lightly. This makes for success. By contrast, a number of the air-cooled cars brought forward this year with a view to competing for the great market that Rover has opened hold out the inducement of greater speed. That way trouble lies. The air-cooled method is easy enough if you do not stress it; but the moment you do so you begin to court trouble. Again, the actual economy of the Rover is notable, forty-five miles to the gallon being quite ordinary.

Another interesting thing about the development of these twin-cylinder engines, whether of the air, air-cum-oil, or of the water-cooled type, is that they owe their evolution to the practicable stage primarily to the motor-cycle industry, not to the motor-car one. The flat opposed twin-cylinder motor is a type that has a very good balance by contrast with the vertical twin-cylinder engine, which was a popular early type that fell out as soon as manufacturing methods were developed to enable four cylinders to be bored in a single operation, thereby making negligible the difference between boring a small four-cylinder block and boring an equivalently larger two-

cylinder block, a type of construction that has inherently a bad balance. Thus we find in the case of Wolseley, who pioneered even the single cylinder horizontal engine with chain drive, made when Sir Herbert Austin was the mainspring of the enterprise in the early days, ultimately abandoned it as a type, whereas the flat twin engine is justifiably employed as the latest practice for cheap car production in the form of the water-cooled 7-h.p. Wolseley. Nevertheless the French makers chiefly favour four vertical cylinders, as instance the water-cooled 6/8-h.p. Mathis. The extensive use of the "hot spot" for warming the mixture in the induction pipe before it enters the cylinders makes for economy as well as for convenience.

Competition between Air and Water Cooling.

These developments have largely been made possible by the frame and suspension design evolved by the Vickers Wolseley concern when they made the Stellite car before the war, as instance the quarter-elliptic springing and the abbreviated frame which characterizes the 10-h.p. and the 15-h.p. Wolseley cars, as well as the new 7-h.p. variety, the 8-h.p. Rover, and the 10-h.p. B.S.A. A development is the rapidly increasing use of the disc or plate type of clutch in combination with three speeds and worm-drive in the back axle. Evidently during next year there will be quite a battle in the small car market between the water- and the air-cooled type of engines, also between twin- and four-cylinder constructions. Mr. Edge is of opinion that the air-cooled type is doomed; but I should hesitate to endorse this view so long as manufacturers proceed on such sound lines as Rover, whose car, now obtainable at the 1922 price, constitutes a real link between the motor cycle and side-car proposition and the motor car, combining as it does motor cycle costs with car service, as witness the amplitude of the body accommodation—a point that seems to have escaped nearly all who seek to enter the market thus created. The French produce a number of cycle-cars, chiefly of no manufacturing or material merit, in which, it seems to be imagined, the world is wishful to progress at great speed and in a sensational fashion, instead of under refined and economical conditions.

From time to time this year a section of the trade and press that objects to the current system of motor-car taxation in this country has put abroad rumours to the effect that the Government is going to abandon the present scheme. That, of course, is manifestly absurd in that the Treasury has to reap a year's revenue from it, and the cumulative results, quarter by quarter, show that anticipations as to yield have been more than realized. Moreover, motorists as a whole have not felt hardships from this. You cannot legislate for the benefit of the manufacturer or user of one make of car and penalize the majority of manufacturers who develop in other directions and the users of their machines. Whether they are British or Continental built cars, all the new style motor cars of the economical sort, which concern eight users out of ten, come off very well under our new taxation. Some hold that there can be no future for these small car constructions, because they do not accommodate four passengers apiece. Unfortunately, some of them are made to do so on occasion, very few of them on lines that can be praised. The Standard is perhaps an exception in this connexion. But for the most part such chassis should be used with two seats and a dickey if really successful service is to be got. It is not so much that the machines by the responsible houses break down as that the going is relatively rough and the accommodation wofully cramped. Unless a small vehicle is produced by a really responsible house, the four-seater design can be described only as unreliable. The costs of running these smaller classes of vehicles are so modest as to widen the market for them every year. The public is now realizing that, though some of them are relatively expensive to buy, the difference in cost between them and the cheapest products of their type is saved in the first year or eighteen months of use. The new scale of price, however, in practically all cases reveals that the vehicles are actually cheap to buy. European motor manufacturers are in the main working on the right lines, looking to long-wearing life as well as economy of service. France and Italy are doing sound business by following this policy. We shall see great developments in this connexion, notably through the aid of racing as an experimental enterprise. In the course of next year in the Isle of Man there will be an event for 3-litre engined cars for the Tourist Trophy, and another for 1½-litre engined cars, apart from which, on the 22nd instant, there will be a 200 miles race at Brooklands for 1½-litre engined cars, as well as for cycle cars having engines of 1,100 c.cm. Next year's Grand Prix race for large cars in France will be for engines of 2-litres volume. Therefore the small high efficiency engine will be tested increasingly with the lapse of every twelve months. A hint of the nature of the value of the development may be had from the fact that limited fuel consumption and the fitting of coachwork will constitute features of one of the Automobile Club de France's Grand Prix races next year. In short, the era of the small economical engine and the durable chassis is already at hand and uninterrupted development in this direction is assured.

England and Wales.

Endowment of a Chair of Bacteriology at Leeds University.

Sir Edward Allen Brotherton, Bt., M.P., has given £20,000 to the University of Leeds for the development of bacteriological study and research, more particularly in the interests of public health. This is the largest individual gift ever received by the University of Leeds. Sir Edward Brotherton, who is an ex-Lord Mayor of Leeds, has been actively interested in many branches of public life, and a number of good causes have benefited by his generous help. But perhaps nothing has made a stronger appeal to him than the problem of improving the health of the community, and in this direction he has been profoundly impressed by the importance of the study of bacteriology. He is Chairman of the University Advisory Committee on the Department of Pathology and Bacteriology. This body includes representatives of the Weekly Board of the General Infirmary, of the Leeds City Council, and of the County Councils of the North, East, and West Ridings. The department of the University of Leeds with which this committee is concerned is engaged in research into pathological and bacteriological questions as well as with the instruction of students, and also performs the bacteriological tests required by the Public Health Department of the city, by the General Infirmary at Leeds, and by other bodies outside the city. The volume of work thus undertaken by the University is now very large.

Manchester Radium Hospital.

The Manchester and District Radium Institute began work in 1915, and we have year by year given an account of the progress of its work. In 1920 the number of patients applying for treatment reached a total of 834, or 157 more than in the previous year. Recently Sir Edward and Lady Holt acquired and equipped a large residence near the Manchester Royal Infirmary as a hospital for the patients of the Institute. Lord Derby, who presided over the meeting at which the deeds of the building were handed over to the Lord Mayor of Manchester last week, said that the record of work done in the Institute showed that much suffering had been obviated or relieved.

Medical Evidence by a District Nurse.

A medical man sends us from North Wales an extract from the *Cambrian News* of September 16th, 1921, containing the report of a coroner's inquiry held at Penmorfa, Portmadoc, into the death of a single woman, aged 64, who had been living alone. No mention is made of the calling of any medical evidence, but it appears from the conclusion of the report that a district nurse's statement of the cause of death was accepted by the coroner: "Nurse Maggie Williams, district nurse, who had attended deceased, said she saw her a week prior to her death, when she complained of being unwell. She suffered from the delusion that she was ailing when she was not. On being informed that she had been found dead, witness made an examination and found that she had died of haemorrhage, followed by suffocation. She had been dead for several days. A verdict of death from natural causes was returned."

A woman is found dead in her house some days—apparently five or six—after she had last been seen by neighbours. No medical evidence is called, but instead the district nurse is permitted to state her opinion that the woman died of haemorrhage, followed by suffocation. This evidence appears to have been accepted in spite of the fact that this same nurse alleged that the dead woman suffered from delusions that she was ailing when she was not. As the woman died this seems to have cast some doubt on the value of the nurse's evidence. However this may be, to call a nurse to give evidence as to the cause of death is, we believe, an innovation, and, in our opinion, a most undesirable one. So far as can be gathered from the short report from which we have quoted, the circumstances of this inquiry call for comment.

Scotland.

New Professors at St. Andrews.

At the opening of the winter term of St. Andrews University the customary ceremony took place in the United College Hall, Principal Irvine presiding. The newly appointed professor of chemistry, Dr. Robert Robinson, F.R.S., and the newly appointed professor of bacteriology, Dr. W. J. Tulloch, were inducted to their respective chairs. In welcoming the new professors Professor Irvine remarked that there was something appropriate in the fact that on the same day a chemist and a bacteriologist should be inducted to their professorial chairs, for the science of bacteriology was as much the offspring of chemistry as of biology.

Edinburgh Royal Infirmary.

At the last meeting of the board of managers of the Edinburgh Royal Infirmary a minute was approved by which there was placed on record the managers' appreciation of the valuable services rendered to the Royal Infirmary by Dr. J. Malcolm Farquharson, whose term of office as surgeon to the ear and throat department expires on October 29th of this year. Dr. Farquharson was appointed to the department in December, 1904, and in conveying to him their hearty thanks for the work which he had accomplished the managers invited him to become a consulting surgeon to the ear and throat department.

Professor Alexis Thomson on Radiation.

In his opening lecture in surgery at the University of Edinburgh, on October 5th, Professor Alexis Thomson dealt with the subject of radiation. He said that there was unanimous agreement in the medical profession that neither x rays nor radium could take the place of operation, and they were obliged to confess that operation was still the most important way of getting rid of malignant disease. What radiation did do was to complete the cure that operation might initiate, and now it was almost a routine for operation in such cases to be followed as soon as possible by the introduction of radium into the wound, or by the subsequent exposure to x rays. He thought it was already possible to say that this routine was giving a larger percentage of cures. The second achievement of radiation was to convert an inoperable tumour into an operable one; but when putting radium into a tumour with a view to performing an operation at a later stage it was most imperative that the operation be performed at the right time. The third advantage of x rays and radium was that they could palliate in hopeless cases; they could improve the condition of the patient by relieving pain, though, unfortunately, in the early stages of malignant disease pain was usually absent, and many serious conditions thus escaped attention. For the most successful results in radiation the surgeon and radiologist should work together, and the medical profession must look to the co-operation of the radiologist and the surgeon for the best results in the future.

THE late Countess of Eldon bequeathed £500 each to the Cripples Fund of the Lord Mayor of London, the Victoria Hospital for Children, the Cancer Hospital, and the Hospital for Diseases of the Heart, and £250 to the Evelina Hospital for Children.

Correspondence.

ON THE OPERATION OF PROSTATECTOMY.

Sir,—We are deploring the loss of one of the most eminent surgeons of our time, Sir Peter Freyer; and no one can have read without cordial appreciation the interesting notices of his personal qualities, and of his career, that have appeared in the columns of the press, both lay and medical. Sir Peter Freyer was a man of strong and original character, and remarkable for foresight and skill in his profession. If some of the statements made in the warmth of admiration and friendship seem to us to call for modification, we desire notwithstanding to associate ourselves no less warmly in the tributes now being paid to a distinguished and lamented colleague. At the same time we feel sure that Sir Peter Freyer's colleagues and friends are far from desiring to describe his achievements, great as they were, in terms inconsistent with truth, and of justice to other distinguished surgeons in the past whose memory we are no less bound to cherish.

To Sir Peter Freyer's qualities of character, invention, and skill, then, we desire to add our own testimony; but, after waiting a while lest we should seem in the least to detract from these tributes, we feel that, in respect of surgical history and of personal justice, there is something more to be said. So far as we have read the obituary notices it has been assumed in all, and in many explicitly asserted, that the modern operation of prostatectomy, as practically effectual, owed its origin and its first performance to Sir Peter Freyer. One writer says scornfully that "some German" had been put forward as his forerunner. We think that this writer—so far as his historical knowledge went—was hardly competent to express an opinion on the matter. A correspondent of the *Times* (September 10th, 1921) said very truly that Sir Peter Freyer's name will always be associated with the great operation of suprapubic prostatectomy; but he added the words "which he devised"; and then described the pitiable state of the victims of prostatic disease before his time. Not of all; we shall show that some of them had already obtained relief.

You, Sir, in the editorial notice of your issue of September 17th, say that "Sir Peter Freyer, on his return to India, may be said to have originated—he certainly perfected and brought into common use—the operation of suprapubic prostatectomy, one of the great advances of modern surgery." A statement so guarded, although containing some error, might not have called for adverse criticism, at any rate not at present. But in the same issue a notice by Mr. Thomson Walker is much less guarded. After claiming for Sir Peter the whole credit for this operation, he writes: "It would be as ungrateful as it is unnecessary to raise again the points of controversy that raged around Freyer's claim to have originated the operation of suprapubic enucleation of the prostate," etc. These words might seem a little arrogant did we not recognize in them the ardour of friendship; that they are excessive we propose to prove. We feel sure of Mr. Walker's good faith; but generosity and gratitude are due to all our great dead, not to one at the expense of another.

Now, Sir, let us set forth, so far as your limits will permit, some historical facts which are not matters of "controversy," but plain witness to truth.

Passing by for the moment earlier publications, at the meeting of the British Medical Association at Leeds in August, 1889, the late A. F. McGill, F.R.C.S,, Professor of Surgery, Surgeon to the General Infirmary at Leeds, and Fellow of King's College, London, opened a discussion on "The treatment of retention of urine from prostatic enlargement." He confined his remarks to the chronic condition. His propositions were that the prostatic enlargements which gave rise to retention symptoms were not rectal but vesical; that they depended upon certain anatomical changes (which he described); that catheterism, if effectual for a time, soon began to fail; that to drain the bladder and to remove the cause of the obstruction permanently more radical measures were necessary; that for this purpose it was better to operate by a suprapubic than by a urethral or perineal route (which alternatives were discussed); that this operation

should be performed with certain means and precautions, among which were (we must omit much detail) the previous management of the bladder and "removal of the prostate, as far as possible, by enucleation by the finger, and not by cutting." He tabulated 24 cases, from the wards of the Leeds Infirmary, thus treated by his colleagues and himself. In estimating the results of these operations he set aside 7 cases as complicated (for example, by calculus); of the remaining 17, 4 deaths were due to the operation (these were of patients in very bad condition), another died of suppuration in the cavum Retzii, another of pneumonia during convalescence, 2 were still under observation in the hospital, one could not be traced. Of the remaining 10, 8 were completely cured, and had recovered full control of the bladder; of the other 2, in one "the operation was very difficult and unsatisfactorily completed," and the result after convalescence disappointing; in the other, after a recovery for eight months, a relapse occurred; the state of this patient also was extremely bad, and he became insane. Eight patients then, who had suffered from long-standing prostatic disorder, had done well, and the bladder had been fully restored to its function. At that time, of course, the operation could not be advised except as the last resource, when the patient was in advanced and menacing disease. In computing McGill's results this condition must be borne in mind. Yet Sir Peter wrote (D.U.O., p. 107): "Apart from the high mortality attending the (McGill's) procedure, it possessed the disadvantage that, though frequently followed by the subsidence of the most prominent symptoms, temporarily, at least (at most?), and rendering the employment of the catheter more easy, in a very large proportion of cases the bladder failed to regain its powers of expelling the urine." . . . "This was because only the prominent portions of the prostate in the bladder were removed." Were these reflections quite judicial?

In concluding his paper McGill pointed out that the priority in this operation belonged to Belfield of Chicago, who, as McGill himself discovered, had performed the operation in October, 1886. Now this report of twenty-four cases was not McGill's first publication on the subject. He had read to the Clinical Society in November, 1887, the notes of three cases, all successful, both immediately and permanently. In the *Lancet* of June 16th, 1888, his colleague, Mr. Atkinson, had published two more, as treated by McGill's operation; one of these was the patient tabulated by McGill who died of pneumonia. Another successful case was reported by Mr. Atkinson at the British Medical Association at Glasgow in 1888.

Now as regards enucleation, on which much stress is rightly laid: in 1889 Mr. Atkinson, while operating on one of his cases, to the surprise of his colleagues and his own satisfaction, enucleated and turned out the whole prostate. One of us who was present well remembers Mr. Atkinson's exclamation, "Look, McGill, what I have done!" This specimen, with many others, is still to be seen in the Leeds Pathological Museum. In his lectures on urinary diseases (p. 108) Sir Peter Freyer wrote: "On Dec. 1st, 1900, I performed a new and what seemed at first sight a very formidable operation for the radical cure of the disease—namely, enucleation of the enlarged prostate." In Leeds, from the day of Mr. Atkinson's happy demonstration, enucleation had been performed in this manner (in appropriate cases) as a rule. As by McGill himself, so by his colleagues, the capsule was incised with scissors and the gland dislodged with the finger. How can it be said, except by those who have never read McGill's papers, that "only the prominent portions of the prostate in the bladder were removed by McGill." Any experienced surgeon must realize that enucleation means either removal of the whole or the major portions of the fibro-adenomatous masses of the prostate, whether it is removed in one mass or in two or more pieces. As some evidence that enucleation was practised as a routine in Leeds, we make a chance reference to a paper by one of us in the *Lancet*, January 4th, 1896.

Of course we do not dream of questioning Sir Peter Freyer's good faith; but he cannot, and his disciples cannot, have read the literature of their subject. Had Mr. Walker before writing his sketch read McGill's classical paper of 1889, a paper wholly free from all egoism? Certainly Sir Peter never went down to Leeds to see these operations, or to inspect the specimens in the Museum. Had he done so we feel sure that he would have been among the first to recognize McGill's priority. May we gently suggest that London also is not without its provincialism. While, during the succeeding years, surgeons in London and other centres were running after phantasies such as vasectomy and castration, in Leeds McGill's operation was never "dropped" nor "died out" . . . "after enjoying a temporary and fitful notoriety" (D.U.O., p. 108). Is it "grateful" to the memory of this brilliant but unhappily short-lived surgeon, who indeed, while initiating "the greatest advance of modern surgery," had upon him a mortal disease (he died in 1890), to say that his work "got no hold on his generation"? If so it were, whose fault was that?

Once more: A method of operation has recently been proposed by which the parts affected can be brought into full view, and so dealt with more precisely. This advantage was not overlooked by McGill. A few weeks before his death he operated in this manner: Having placed the patient in the Trendelenburg position, he made a transverse incision through the abdominal wall just above the pubes, and then, opening the bladder also by a transverse incision in a corresponding position, he gave a perfect view of the parts. This operation was a complete success and the final result excellent. If we remember right, Mr. Hurry Fenwick was present on that occasion.

To Sir Peter Freyer's zeal, skill, and drive we owe the rout of vasectomies, castrations, and other follies; the persistent advocacy of a most beneficent operation; the improvement of it in many details; and, as aseptic surgery was elaborated, the judicious boldness which urged its performance at earlier and earlier periods of prostatic disorder, and so under less and less adverse conditions. Thus insistently and successfully he brought the method into general acceptance, and achieved a great work for which he will be remembered as one of the benefactors of mankind.—We are, etc.,

HARRY LITTLEWOOD,
CLIFFORD ALLBUTT.

Cambridge, Oct. 5th.

INFLUENZA (?) WITH ERYTHEMATOUS ERUPTION.

SIR,—The letter, published by you on October 8th, on an erythematous rash being met with at present in Ireland is of great interest.

Last April I encountered this rash on a patient complaining of "palpitation." The erythema was confined to the face, but on both forearms and both shoulders there were present a number of spots which resembled flea-bites. They were, however, certainly not flea-bites. They spread to the groins and legs and did not disappear for about ten days.

About a week later I developed the same rash myself. Its appearance was heralded by slight giddiness and nausea and some joint pains. I noticed that after every meal there was a sense of heat and burning in the skin, which lasted a short time. After this I saw several other cases—in all twenty-six. The following are notes of one of these:

A woman noticed marked tenderness of her gums and a painful area near the palate. She felt markedly drowsy. About six days later there was a sense of fullness in the abdomen, some cyanosis, very evident "puffiness" under the eyes, and what was correctly described as a "measly look." There was abdominal pain. The condition got worse and the facial blotching resembled rubella. There was some blotching on the arms and the "flea-bite" rash appeared on arms and shoulders. Burning of the skin after a meal was also marked. Twitching of the eyelids was complained of. The rash faded in about five days, leaving a sense of great exhaustion. There was a branny desquamation which was considerable. The flea-bite spots disappeared much more slowly. This patient has had a slight relapse of the condition recently.

The other cases were, in the main, similar. The curious thing about the condition seems to be its tendency to relapse. The flea-bite spots reappear, though in a much less evident form. There is gastric disturbance and some pallor. There is also a tendency to palpitation, faint feelings, and giddiness. It is this last fact about the disease which seems to mark it off from influenza—though I am not in a position to discuss its bacteriology. Its effects on the heart more nearly resemble those of a prolonged infection—for example, subacute rheumatism—than those of a sharp but passing attack.—I am, etc.,

R. M. WILSON.

London, W., Oct. 9th.

Sir,—With regard to the letter from Dr. J. E. H. Gatt about this type of influenza I may say that during the last great influenza epidemic I saw two cases with a scarlet rash, and I at once told the patients that the condition was influenza with a rash and not scarlet fever. The temperatures ranged from 101° to 103°. The rash existed for some days and it was more like the scarlet rash of scarlet fever than anything else. The throats were scarcely affected. There was no desquamation and each case recovered without any after-effects. I did not see any other rashes in the district at the time. There is not the slightest doubt as to the occurrence of these cases, but as to their nature I cannot say.—I am, etc.,

Glandyfi, Cardiganshire, Oct. 8th. D. Owen Williams, M.B.

PATHOLOGY OF INSANITY.

Sir,—A few days ago the Bishop of Kensington presided at a conference of a Spiritual Healing Fellowship at Church House, Westminster. For an account of the proceedings I am indebted to the London daily papers. I quote from one of them:

"Dr. Montagu Lomax, whose book describing his experiences as physician in a lunatic asylum has recently created so much stir, spoke about the wide scope available for spiritual healing. Psycho-analysis he sweeps aside. Of merely material medical treatments he knows the futility. In spiritual forces against mental weakness he has profound belief. And then Dr. Lomax expressed a rather startling belief in demoniacal possession and reincarnation. 'While I believe that the ills men suffer are the consequences of their own misdeeds,' he said, 'I do not necessarily mean in their present existing life, but in a previous incarnation.' The Bishop's fine head became a little more covered by his hand, and his manner a little anxious at this pronouncement by Dr. Lomax."

A quotation from a second London daily newspaper is as follows:

"A paper on spiritual healing in relation to mental disease was read by Dr. Montagu Lomax, who said he believed that insanity was sometimes much more than the uncontrolled riot of the subconscious mind. He believed that in many cases, especially those of epilepsy, acute mania, and melancholia, the subconscious mind of the moment was not uncontrolled, but that it was controlled by an evil and obsessing discarnate entity."

Has Dr. Lomax been correctly reported?—I am, etc.,

October 5th. M. H.

Sir,—The causation and pathology of insanity are complex and obscure subjects on which enlightenment has been a very slow and disappointing process. Many have been too ready to account for this by the easy method of laying the whole blame on asylums and asylum doctors; but this is unjust, for it must be admitted that our knowledge of the physiology of mental operations is still in a very primitive condition, and a psychology of any practical value whatever in medicine is only now being created. Can it be alleged that in the analogous problems connected with epilepsy, presumably of a much simpler nature, in spite of special hospitals and the application of the ablest intellects engaged in medicine, our insight is any more satisfactory?

These reflections have been elicited by reports in the daily press of a paper "On spiritual healing in relation to mental disease," by Dr. Montagu Lomax, read at a conference at Church House, Westminster, presided over by the Bishop of Kensington. As is well known, Dr. Lomax is the author of a book (reviewed in the British Medical Journal of August 20th) in which the administration of asylums, with the exception of the Metropolitan and the Scottish, is adversely criticized; at the conference he seems to have entered upon a new field of inquiry and speculation, for, if he be correctly reported, he has given expression to views on the causation and pathology of insanity which, to say the least, are in "an asylum doctor" most unusual, if not unique, and if true must create as much stir in scientific circles as his work has done among those engaged in administering asylums. It is reported that "Dr. Lomax expressed a rather startling belief in demoniacal possession and reincarnation." "While I believe that the ills men suffer are the consequences of their own misdeeds," he said, "I do not necessarily mean in their present existing life, but in a previous incarnation." Also, "He believed that in many cases, especially those of epilepsy, acute mania and melancholia, the subconscious mind of the moment was not uncontrolled, but that it was controlled by an evil and obsessing discarnate entity." These views are of course not original, for they have been and are still held by primitive man in many parts of the world to account for mysterious psychic phenomena; but many would read in another book the elaboration of these themes and the evidence of their truth by the cultured and able pen of Dr. Lomax with great interest. In passing, it may be said that one of Dr. Lomax's chief complaints in his book is that he was not sufficiently consulted regarding his cases by the medical superintendent of the asylum in which he was a temporary medical officer during the war; but if the above reports of his views on insanity be accurate, it is not altogether surprising that co-operation was not perfect. Dr. Lomax in his book records his great admiration for the late Dr. Charles Mercier, but there can be little doubt as to the value that eminent psychiatrist would have attached to the views of any assistant medical officer entertaining such opinions.—I am, etc.,

October 9th. North Britain.

TREATMENT OF SYPHILIS IN WOMEN.

Sir,—I notice that in the discussion, reported in the Journal of September 24th, on the treatment of syphilis Dr. Swayne uttered a warning against the use of large initial doses of salvarsan substitutes in women. It is not reported that he said what he considered "a large initial dose." He attributes the death of a girl of 20 to "a large initial dose," though he admits he does not know the dose she received.

I have recently had a fatal case in a girl, aged 23, after a second dose of 0.45 gram N.A.B. given after a week's interval, during which potassium iodide was administered and no mercury. The first dose had produced marked benefit both locally and generally. The second dose produced marked benefit locally, but after four days the patient returned to hospital in a moribund condition.

This case was clinically tertiary, probably congenital, and very dirty locally and generally. At the *post-mortem* examination she was found to have a persistent thymus and a haemorrhage in one suprarenal capsule; the kidneys were congested and their capsules adherent in patches; there was atheroma of the arteries at the base of the brain, but no haemorrhages nor increased cerebro-spinal fluid, nor meningitis, though the history indicated that the patient suffered from gradually deepening coma from the evening on which the intravenous injection was given; the relative's words were that she returned home "not properly out of the chloroform." Going home involved a railway journey, and there is room to doubt whether she obeyed instructions as to preparing herself for the injection beforehand or resting after it.

It is my observation that congenital cases do not tolerate large doses, but I have not hitherto had reason to regard 0.45 gram as a large dose.

The possibility has occurred to me that secondary organisms may make patients peculiarly susceptible to N.A.B. I should be glad to know if this association has been observed in other fatal cases. If so, should we withhold salvarsan substitutes in thoroughly dirty cases until the patient has first been cleaned up, or can we regard 0.3 gram as a sufficiently small dose?—I am, etc.,

Cardiff, Sept. 29th. Erie Evans.

RHEUMATISM AND BACON.

Sir,—In the Journal of October 1st there appears an interesting letter under the heading "Rheumatism and Bacon," in which the writer comes to certain conclusions after sixteen years of observation, and advances a thesis which he hopes will be confirmed or refuted. Having suffered severely from the "muscular rheumatism," "lumbago," "myalgia," and "neuritis," to which he refers, and having during a similar period paid special attention to the rheumatic type of disease and treated a very considerable number of cases, I would like to make a few comments.

In the first place it is unfortunate that the term "rheumatism" is still so extensively used and abused. Most cases diagnosed as such have no relation, as far as we know, to acute rheumatism or rheumatic fever, and are

better classified under the now generally accepted term "fibrositis," which explains the pathology of the condition.

We do not as a rule know the definite cause of the initial fibrositis, but once fibrous tissue has become thickened there are many causes which will produce pain, stiffness, or discomfort.

It is extremely doubtful if any one article of diet is more liable to cause fibrositis than another, but it appears certain that any form of diet which increases intestinal fermentation or decomposition may precipitate an attack. The old saying, "One man's meat is another man's poison," is very true in this connexion, and if any definite foodstuff can be proved to be the *fons et origo mali* it should be avoided; otherwise sufferers from fibrositis, in my experience, do best on an ordinary mixed dietary.

Bacon is not indigestible if suitably cooked, and bacon fat has the great advantage that it can be easily digested by those who have difficulty in digesting other fats. I have treated many Jews suffering from fibrositis who had never eaten bacon, and, on the other hand, have seen many patients cured who had always eaten bacon and continued to eat it every morning at breakfast. I have suffered from fibrositis during periods in which I had not partaken of bacon, and have had no recurrence during periods when I ate bacon freely. I therefore do not agree with the statements—"bacon is unsuitable for rheumatic people," "it may be called a poison to rheumatic people," and "rheumatic people (muscular type) are always bacon eaters."

I do not know of any evidence to prove that "bacon excites an attack of rheumatism."

Aspirin I prefer to sodium salicylate in fibrositis, as it gives more efficient relief from the pain, and certainly bacon does not prevent its beneficial action. As a rule the results obtained from medicinal and dietetic treatment in these cases are disappointing.—I am, etc.,

K. R. COLLIS HALLOWES,
Physician, Peebles Hydropathic.

October 3rd.

SIR,—In suggesting some relation between bacon and rheumatism Dr. Drinkwater states that "those who never touch bacon or ham or other salted meat seldom, if ever, complain of rheumatic pains." Jewish people are by no means immune from rheumatism. I believe it is of common occurrence among them. The majority, however, do not partake of bacon or ham, and other salted meat is not a frequent dish.—I am, etc.,

S. LEVY SIMPSON.

Cambridge, Oct. 4th.

SODIUM BIBORATE IN EPILEPSY.

SIR,—I was very glad to see Dr. McCartney's second contribution on this subject in the JOURNAL of October 1st after his first contribution of October 9th, 1920. I tried the combination of potassium bromide with sodium biborate on several of my patients with very satisfactory results. I also induced some of my friends to try it, and their results have been equally satisfactory. On my holiday this year I visited a large asylum with 800 patients and a goodly number of epileptics, which I had visited last year, and the two doctors there had been trying it, but their results were not so satisfactory as mine. This may be due to various causes, such as traumatism or long chronicity, but I think there must be a large number of cases in which the combination must act very well. Dr. McCartney's results are remarkable, and I think a wider exhibition of the remedy ought to be encouraged and further notes of experiences given in the JOURNAL.—I am, etc.,

JAMES CRAIG, L.R.C.P.and S.Edin.

Dennistoun, Glasgow, Oct. 3rd.

ZYMOTIC DIARRHOEA AND EARTH TEMPERATURE.

SIR,—In your article headed "Zymotic diarrhoea and earth temperature" (August 20th, p. 292) it is stated that the observation of Ballard regarding the correlation of summer diarrhoea and the rise of the 4 ft. thermometer above 56° F. has been strikingly illustrated this year, although the chain of events connecting these two facts is unknown. The prevalence of flies has been suspected as the cause, but as they are often numerous in spring and late autumn, when the 4 ft. thermometer is below 56° F., there is still a missing link. May I suggest a possible one?

As the result of following up observations first made in India in 1909, I am of opinion that the only important method of enteric infection by flies is by means of their excrement, and, further, that the bacterial flora of the fly's intestine depends on the first meal of the newly hatched larva; that is to say, that a fly bred in horse manure passes in its excrement during the whole of its life the bacteria of the manure it was bred in. Similarly, a fly bred in faecal matter passes the bacteria of the faeces, thereby, in suitable cases, becoming a true host and carrier of typhoid bacilli. Evidence in support of this view was published in the *Journal of State Medicine*, September and October, 1915.

The same theory would account for the fact that in France, for some unknown reason, bacillary dysentery became very prevalent every August and September, subsiding again in October. Thus in 1918 the figures for August and September were 5,000 cases in each month, while the average for the remaining ten months was about 700. In August, 1918, when I was A.D.M.S. of the Fourth Division, I found flies breeding in faecal matter buried in shell holes on our front trenches, dysentery having at this time become prevalent. In October and November we occupied billets left by the Germans, and found the sanitary conditions absolutely filthy; yet, although there were plenty of flies, there was not only no dysentery, but scarcely any diarrhoea. Considering the cold weather these flies could only have been bred in fermenting horse manure. As a contrast to this the Americans who followed the Germans in August and September of the same year had a very severe outbreak of dysentery. In these last-named months it was quite hot enough for flies to hatch out in faecal matter.

As regards summer diarrhoea, then, my suggestion is that till the 4 ft. thermometer reaches 56° F. flies can only breed in horse manure, which does not contain the germ of summer diarrhoea; there can therefore be no epidemicity resulting, in spite of the insanitary conditions in privy middens and earth closet towns. After the temperature reaches 56° F., however, flies can also mature in garbage or other refuse containing the germ of summer diarrhoea, and epidemicity results.—I am, etc.,

N. FAICHNIE,
Colonel Army Medical Service (retired).

Port Elizabeth, South Africa, Sept. 19th.

WOMEN AT CAMBRIDGE.

SIR,—Although we hold diverse views on the position of women in the University of Cambridge, we have determined to support the compromise contained in Grace I to be laid before the Senate on October 20th. If this were carried, women would be admitted to degrees; they would be represented on the Boards of Studies and become eligible for lectureships and professorships. But they would not be full members of the University, and the number of women students at any one time would be restricted to five hundred. We believe that it is of the utmost importance to put to the test of further experience whether women should be placed in precisely the same position as men in the University. This compromise would give such an opportunity, and we understand that if it were carried the women's colleges would not appeal against such a settlement. For these reasons we hope that other members of the Senate may find themselves able to accept this compromise. — We are, etc.,

S. M. COPEMAN, HENRY HEAD,
MAURICE CRAIG, HUMPHRY ROLLESTON,
H. H. DALE, G. ELLIOT SMITH.
T. R. ELLIOTT,

London, W., Oct. 11th.

SIR,—Throughout a long controversy the supporters of Grace I have brought forward no valid reason why the decision of last December should be reversed. Their proposals are now even more objectionable than those of December 8th; the suggested safeguards are illusory. I hope that medical members of the Senate will mark their disapproval of an unjustifiable proceeding by voting *non-placet* on Grace I, and will remove the disabilities from which women feel they suffer by voting *placet* on Grace II. —I am, etc.,

CHARLES BUTTAR.

London, W., Oct. 11th.

SOME FACTORS CONTROLLING THE NORMAL SUGAR CONTENT OF THE BLOOD.

SIR,—Since our paper bearing the above title was written, in the early part of this year, we have obtained further experimental evidence in support of our argument that the sugar content of the blood is largely dependent upon its reaction, and that the variations in the percentage of sugar following the ingestion of food result from changes in the reaction of the blood produced by the absorption of salts formed from the digestive secretions.

As the carbon dioxide tension of the alveolar air varies inversely as the hydrogen ion content of the blood, and furnishes a very delicate index of changes in its reaction, it occurred to us that a comparison of the carbon dioxide content of the alveolar air and the percentage of sugar in the blood at short intervals for several hours after a test meal would be interesting. Numerous experiments have proved that there is a direct and intimate relation between the two, the carbon dioxide tension falling regularly as the blood sugar rises, and vice versa. Bennett and Dodds (*Brit. Journ. Exp. Path.*, 1921, ii, p. 58) have recently shown that in normal individuals the curve of alveolar carbon dioxide tension after a meal corresponds closely with the curve of secretion of gastric hydrochloric acid, and, since we find that the blood sugar curve moves in exactly opposite directions to the carbon dioxide curve of the alveolar air, it follows that the variations in the sugar content of the blood after a meal are probably also related to the secretion of gastric hydrochloric acid.—We are, etc.,

P. J. CAMMIDGE.
J. A. CAIRNS FORSYTH.
H. A. H. HOWARD.

London, W., Oct. 7th.

*** The paper by Dr. Cammidge, Mr. Cairns Forsyth and Mr. Howard is printed at p. 586.

Obituary.

CHARLES GIBSON, M.D., J.P.,
Harrogate.

WE regret to record the death of Dr. Charles Gibson, of Harrogate, which took place on October 3rd. Educated at the medical school of the University of Durham, at Newcastle, Dr. Gibson obtained the diplomas of L.R.C.P., L.R.C.S.Edin., and L.S.A. in 1875, and subsequently graduated M.D.Brux. in 1888. He was appointed house-surgeon at Bootle, and thereafter was in practice for some years at Tynemouth. In 1891 he went to Harrogate, where he spent the remainder of his life and built up a large practice as a physician.

Dr. Gibson was for many years physician, and later consulting physician, to the Royal Bath Hospital, Harrogate, and he acted also as physician to a number of other charitable institutions there. Dr. Gibson was for many years a very keen member of the British Medical Association, and was for a time president of the Yorkshire Branch. For a long period he acted as honorary secretary of the Harrogate Division, and he was a regular attendant at the annual meetings of the Association. In 1897 Dr. Gibson wrote some practical notes on Harrogate as a health resort, which were printed in the BRITISH MEDICAL JOURNAL. He was a member of the Harrogate Medical Society, secretary for many years of the West Riding Medical Charitable Society, and secretary of the Royal Medical Benevolent Fund. In 1904 he was appointed a Justice of the Peace.

He leaves a widow and two sons, one of whom is in practice at Worthing; a third son was killed at the Dardanelles in 1915.

BENJAMIN POULTON, M.D., M.R.C.S.,
Adelaide, South Australia.

WE regret to record the death of Dr. Benjamin Poulton, one of the leading Australasian surgeons, and a prominent officer-bearer of the British Medical Association in Australia. Dr. Poulton received his medical education at the University of Melbourne, where he graduated M.B. in 1874; he subsequently took the degree of Ch.B. in 1879, and the M.D. in 1884. He also spent a considerable time in London, working both at St. Bartholomew's and St. Thomas's Hospitals, and in 1880 he took the diploma of M.R.C.S.Eng. On his return to Australia in 1882 he was appointed a house-surgeon at the Adelaide Hospital, where in time he became an honorary assistant surgeon, and eventually honorary surgeon. In 1890 he was appointed lecturer in surgery at the University of Adelaide, and in 1892 he was elected dean of its faculty of medicine. Dr. Poulton took much interest in the work of the British Medical Association, which he joined in 1882. On his initiative the first Intercolonial Medical Congress was held in Adelaide, in 1887, when he acted as secretary, a post which he again held in 1905, when the congress, now having changed its name to the Australasian Medical Congress, again came to that city. He was honorary secretary of the South Australian Branch of the Association for four years, and in 1909 and again in 1912 he was elected president of the Branch. He retired from most of his professional offices in 1920. He was known as an accurate and keen observer, as a popular teacher for thirty years, and as an excellent surgeon of unfailing industry. He is survived by his widow and three daughters.

COLONEL VALENTINE MATTHEWS, C.B.E., whose death is announced at the age of 66, was educated at St. Paul's School and King's College Hospital. He qualified with the diplomas of L.S.A. in 1878, and M.R.C.S.Eng. in 1880. After a career of some distinction as a medical student he served as house-surgeon and medical registrar at his hospital; subsequently he was senior surgeon to the Westminster General Dispensary, and he practised for thirty-five years in Suffolk Street, Pall Mall, and afterwards at Onslow Square. He was the author of a number of contributions to the medical journals. Colonel Matthews had been a very keen volunteer, and was in command of the London Company R.A.M.C. Volunteers from 1904 to 1908; he was a holder of the Volunteer Decoration. At an age which made active service impracticable, Colonel Matthews was, however, in the early days of the war one of the first to realize the necessity of arranging to meet men returning home on leave from the Continent and to convey them from one railway terminus to another. Before any real organization was completed he was constantly at work during the night in these early days, but it was as an active organizer of the Rest Houses, with their many thousands of beds, and of the Free Buffets in the metropolitan area, that Colonel Matthews will best be known. His genial personality and encouraging presence found a way through difficulties which at times appeared unsurmountable. His services were publicly recognized by the award of the C.B.E. (military). He leaves a widow and one son, who is a medical man in practice at South Kensington. His younger son, who was a lieutenant in the Royal Navy, went down in H.M.S. *Hampshire* during the war.

THE celebrated physiologist, François Franck, professor at the Collège de France, and member of the Académie de Médecine, has recently died at the age of 72.

Universities and Colleges.

UNIVERSITY OF OXFORD.

MR. EDWARD LIDDELL, M.A., B.M., has been elected to a non-official fellowship at Trinity College, for research in physiology.

UNIVERSITY OF LONDON.

UNIVERSITY COLLEGE.

A COURSE of eight lectures on nutrition were commenced on October 14th at University College, Gower Street, W.C., by Dr. J. C. Drummond, and will be continued at 4.30 p.m. on succeeding Fridays up to and including December 2nd. Attendance at the course is recognized in connexion with the B.Sc. (Honours) degree in physiology. The lectures are addressed to advanced students of the University and others interested in the subject; admission is free without ticket.

KING'S COLLEGE: DEPARTMENT OF PSYCHOLOGY.

A course of public lectures on psychology and psychotherapy will be delivered by Dr. William Brown, Wilde Reader in Mental Philosophy in the University of Oxford, on Tuesdays, at 5.30 p.m., beginning October 18th. Admission is free without ticket.

UNIVERSITY OF MANCHESTER.

THE following awards have been made:—Kay-Shuttleworth Scholarship: R. Pendlebury. Entrance Scholarships in Medicine: W. Brockbank, C. N. H. Long. Edmund Roscoe Post-Graduate Scholarship: Margaret R. Toynbee. The Sir Clement Royds Memorial Scholarship in Chemistry: J. F. Wilkinson.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

AT a meeting of the Royal Faculty of Physicians and Surgeons, held on October 3rd, the following were admitted (after examination) as Fellows of Faculty: G. B. Brand, J. W. Dalgleish, J. R. C. Gordon, M. A. Keshvalu, J. W. Leitch.

CONJOINT BOARD IN SCOTLAND.

THE following candidates, having passed the requisite examinations, have been admitted Diplomates in Public Health:

A. F. Adamson, Isabella M. M. Aitken, W. R. Clayton-Heslop, E. M. E. Cumming, W. Cunningham, A. Davidson, A. M. Davidson, Jean D. Don, D. Fyfe, Janet Grant, D. C. Lamont, Isabel Macfie, W. McKendrick, Jane S. McPhail, G. Morris, T. D. Murison, E. W. Richards, Helena J. Robertson, R. Sandilands, J. W. Simpson, A. D. Stewart, Mary C. Walker.

THE INSURANCE CAPITATION FEE.

AFTER the conference on October 11th between the Minister of Health and the Insurance Acts Committee, reported in the SUPPLEMENT this week, the Committee met and addressed a letter to the Minister in which it stated that while recognizing the force of the appeal to insurance practitioners to make some sacrifice on patriotic grounds, the Committee is not prepared to ask the Panel Conference to accept, even on those grounds, a reduction of the capitation fee to 9s. 6d. In view of this expression of opinion, the Committee accordingly urges Sir Alfred Mond to reconsider the position. If, the Committee says, he could modify his offer to one of 10s., the Committee on its part is prepared to urge the Conference to accept it. In a circular issued at the close of this week to the Secretaries and Chairmen of Local Medical and Panel Committees and to the representatives appointed to the forthcoming Conference, the Medical Secretary asks these committees not only to meet before the Conference and discuss the position, but to take a referendum of every insurance practitioner in their areas on the two questions: "(*a*) Are you willing to accept a capitation fee of 10s.?" "(*b*) Are you prepared to refuse service at a capitation fee of 9s. 6d.?" Should the Minister not be prepared to modify his offer, it is essential that the Panel Conference on October 20th shall know what prospect there is of insurance practitioners throughout the country refusing service at a capitation fee of 9s. 6d. In order that the Conference may be in a position to come to a decision which will represent the wishes of insurance practitioners generally, it is of the utmost importance that their representatives shall come to the Conference prepared with the fullest and latest local information.

Medical News.

THE South-Eastern Union of Scientific Societies is, at the request of the Ministry of Health, continuing its inquiry into the distribution, habits, and breeding places of *Anopheles plumbeus*, a mosquito which it has been shown may become infected with the malarial parasite. Inquiries made by the Union this year show that the species is extensively distributed throughout the south-eastern area of England. In some districts all stages have been found; in others only larvae and imagines; it hibernates as partly grown larvae, mainly in beech, birch, chestnut, and holly tree holes; imagines are found in every season of the year, except winter.

THE first general meeting of the Midland Tuberculosis Subgroup of the Society of Medical Officers of Health will be held at the Anti-Tuberculosis Centre, 44a, Broad Street, Birmingham, on October 22nd, at 3 p.m. All members of the Society of Medical Officers of Health actively engaged in connexion with tuberculosis work are asked to attend. The business includes the confirmation of the proposed rules and the election of officers and committee.

THE Prince of Wales's General Hospital inaugural dinner will be held at the Trocadero Restaurant, Piccadilly Circus, on Thursday, October 27th, at 7.30 for 8 p.m. Past residents and students of the hospital who have not received a notice can obtain further particulars by writing to Mr. H. W. Carson, 111, Harley Street, W.1.

A POST-GRADUATE course of lectures and demonstrations in the Sheffield hospitals, arranged by the Faculty of Medicine of the University of Sheffield, was commenced at the Sheffield Royal Infirmary on Tuesday last, when Professor Connell dealt with fractures and Professor Mellanby with recent views on diet. The course will be continued on Wednesday and Friday up till and including December 16th.

AT the meeting of the Medico-Legal Society, to be held at 11, Chandos Street, W.1, on Tuesday, October 18th, at 8.30 p.m., Mr. W. Valentine Ball, Barrister-at-Law, will read a paper on "Incapacity for work within the meaning of the National Insurance Act, 1911."

UNDER the auspices of the Fellowship of Medicine a course of twelve lectures on gastro-intestinal affections in children will be given at the children's clinic, Western General Dispensary, Marylebone Road (next door to Edgware Road metropolitan station), on Mondays and Thursdays, at 4.45 p.m., commencing on October 17th. The fee for the course is one guinea and a half to members of the Fellowship, or two guineas to non-members; tickets can be obtained from the Secretary of the Fellowship of Medicine, 1, Wimpole Street, W.1.

DR. WILLIAM F. R. BURGESS, O.B.E., has been elected Master of the Society of Apothecaries.

ETHER was first used for a surgical operation on October 16th, 1846, and the seventy-fifth anniversary will be celebrated at the Massachusetts General Hospital on October 18th, in association with the centenary of the hospital.

ACCORDING to the *Boston Medical and Surgical Journal* the death rate in the United States from tuberculosis of the lungs was 20.7 per cent. lower in the first three months of 1921 than in the corresponding period of 1920.

AT the annual dinner of the Society of Medical Officers of Health, to be held at the Café Royal, Regent Street, on Friday, October 21st, the speakers will include Sir Alfred Mond, Minister of Health, the new President (Dr. W. J. Howarth), the retiring President (Dr. F. E. Fremantle, M.P.), Sir George Newman, the Bishop of London, the Attorney-General, Lord Burnham, and the President of the Royal Society. Application for tickets (15s. each) should be made to the Executive Secretary, 1, Upper Montague Street, Russell Square, W.C.1.

THE late Mr. J. C. Pipe, of Ipswich, has bequeathed £1,000 each to the East Suffolk and Ipswich Hospital and St. Bartholomew's Hospital, London. The residue of the estate, after payment of certain other bequests, goes to his brother for life, and reverts subsequently to certain charities including the two hospitals.

THE hospital founded at San Remo by German physicians in 1912 for medical diseases, excluding infectious disorders and tuberculosis, has been purchased by Italian capitalists for three million lire. Professor Giovanni Galli has been appointed director.

ACCORDING to the *East African Standard* of August 31st a Government measure, the Medical Practitioners and Dentists Bill, came under the consideration of the Legislative Council of Kenya in August. This bill apparently dealt with the subject of granting licences to (partially trained) subassistant surgeons of a certain standing, but by one vote an amendment was passed that licences should be granted to European assistant surgeons only. The Government accordingly withdrew the whole bill.

THE University of Maryland has made tentative plans for medical extension work by establishing health clinics in the smaller towns, where medical practitioners may see demonstrations of new ideas in medical and surgical practice, and receive instruction in certain special subjects. This work will be carried on by co-operation between the United States Public Health Service and the Johns Hopkins Medical School.

A COURSE, we are informed, has recently been held at Frankfort-on-Maine to instruct the wives of medical practitioners how to do the book-keeping for their husbands.

THE Countess Brassey formally opened the Bruce-Porter Convalescent Home at Folkestone on September 24th. The home is a branch of Dr. Barnardo's homes, and is intended as a convalescent home for destitute boys and girls. It has been presented by Mr. Howard Williams, and named after Sir H. E. Bruce-Porter, K.B.E., C.M.G., M.D., in commemoration of his work for the wounded in the great war.

THE mortality among children under 1 year in the famine area in Russia is stated to be 75 per cent. As the result of an investigation made by the Bolshevist authorities 112,582 cases of cholera have been found in thirty departments.

THERE will take place at the same time at Naples—namely, from October 25th to 28th—the twenty-seventh Congress of the Italian Society of Internal Medicine, the twenty-eighth Congress of the Italian Society of Surgery, the twelfth Congress of the Italian Society of Orthopaedics, and a meeting of the Italian Committee of the Internal Society of Urology (to reconstitute an Italian Society of Urology).

MESSRS. DUNCAN, FLOCKHART AND CO. inform us that in future all preparations issued by them containing any of the medicaments affected by the regulations made under the Dangerous Drugs Act, 1920, will be fully labelled to this effect. The firm has prepared a card summarizing the salient points of the regulations. It will be sent to any member of the medical profession, and may be useful as a reminder to those who have studied the article published in the SUPPLEMENT to the BRITISH MEDICAL JOURNAL of August 27th.

PROFESSOR LÉON FREDERICQ is to presented with a medallion in recognition of his distinguished services as professor of physiology for fifty years in the University of Liége; the presentation will take place in November, when his son will begin to occupy the chair which Professor Léon Fredericq has held so long.

Letters, Notes, and Answers.

As, owing to printing difficulties, the JOURNAL *must be sent to press earlier than hitherto, it is essential that communications intended for the current issue should be received by the first post on Tuesday, and lengthy documents on Monday.*

ORIGINAL ARTICLES and LETTERS *forwarded for publication are understood to be offered to the* BRITISH MEDICAL JOURNAL *alone unless the contrary be stated.*

CORRESPONDENTS who wish notice to be taken of their communications should authenticate them with their names—of course not necessarily for publication.

AUTHORS desiring reprints of their articles published in the BRITISH MEDICAL JOURNAL are requested to communicate with the Office, 429, Strand, W.C.2, on receipt of proof.

IN order to avoid delay, it is particularly requested that ALL letters on the editorial business of the JOURNAL be addressed to the Editor at the Office of the JOURNAL.

THE postal address of the BRITISH MEDICAL ASSOCIATION and BRITISH MEDICAL JOURNAL is 429, Strand, London, W.C.2. The telegraphic addresses are:

1. EDITOR of the BRITISH MEDICAL JOURNAL, *Aitiology, Westrand, London*; telephone, 2630, Gerrard.

2. FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate, Westrand, London*; telephone, 2630, Gerrard.

3. MEDICAL SECRETARY, *Mediscra, Westrand, London*; telephone, 2630, Gerrard. The address of the Irish Office of the British Medical Association is 16, South Frederick Street, Dublin (telegrams: *Bacillus, Dublin*: telephone, 4737, Dublin), and of the Scottish Office, 6, Rutland Square, Edinburgh (telegrams: *Associate, Edinburgh*; telephone, 4361, Central).

LETTERS, NOTES, ETC.

DEGREES AND DIPLOMAS.

"TRIPLE QUALIFICATION" writes: In the article on the profession of medicine in the Educational Number of the BRITISH MEDICAL JOURNAL of September 3rd the writer frankly recognizes the inferior position in which a holder of licences or diplomas may remain in comparison with those who possess a university degree. In this he but voices the popular sentiment of the profession, and more so those responsible for the disposal of medical appointments. That this is a general feeling and attitude cannot be denied. It is all very well to bring forth official statements as to diplomas and licences being recognized as on an equality with university degrees; but let a man with a diploma and one with a degree try for the same post and let but these facts of their training become known—the want of the degree is all but damning in most cases. In the face of such evidence how can the faculty go on philosophically discussing equalities when there are no equalities? The universities have quietly taken over the use of college hospitals and college teachers and college lecture halls which they are continuing to use, and in return for this they have given us nothing but an empty honour; such a state cannot continue. To warn the future student to enter the medical profession only by university training and university degree is to discourage all future attendance at colleges which the faculty have recognized on an equal basis with the university training. The problem is vital and must be faced. If the faculty is clean-handed and sincere, let them grant the colleges the right of conferring degrees. There is only needed a change of names—degree for licence, degree for diploma: that for the present student and the future students. But they must also render justice to the great army of college-trained men who have already passed through, and are at present carrying on practice. Many of these with giant practices and splendid records behind them are smarting daily under the social injustice and "their position is indeed unfortunate." To them, too, the opportunity of retrieving must be given—a one-portal system, or some system able to give them that recognition which years of success and personal endeavour have failed to give them.

FACILITIES FOR MEDICAL MOTORISTS.

THE proprietors of Maude's Motor Mart, 100, Great Portland Street, W.1, are developing some interesting proposals which may be of service to medical practitioners. All motor cars require occasional overhauling and repair; but the work of a doctor is so continuous that unless he keeps two cars, or is prepared to forego the pleasure and comfort of a car during his holidays, he is compelled to find other means of conveyance, often for some weeks in each year. At Maude's Motor Mart the medical man can hire a small car and drive it himself, while being responsible, not for ordinary wear and tear, but only for such damage as is usually covered by his own insurance policy. The cost of hiring is about ten guineas a week, with substantial reduction if in the meantime the hiring-out firm does the repairs to the doctor's own car. This proposal offers a convenience to medical practitioners which we have long thought to be required. Again, the proprietors of this motor mart, in offering for sale Albert cars, are allowing prospective purchasers to hire a demonstration car of that make at a charge of four guineas for twenty-four hours, so that by driving himself the prospective buyer may ascertain whether the car will suit his requirements instead of being at the mercy of an expert tuner-up engaged in showing forth the merits of his wares. Finally, facilities are given for extended payments, so that the purchaser may spread the cost of a new car over two years on moderate terms. Enterprise of this nature shows that the motor business is beginning to assume a reasonable attitude wherein the comfort and convenience of motorists is the first consideration.

VERDANT VERSE.

"J. G. M." (South Africa) writes: I send the following verses, based on the *first* few lines of the *first* paragraph of the *first* article in the *first* number of the BRITISH MEDICAL JOURNAL for 1921, dated the *first* of January: "Abdominal pain in a child must always be a source of anxiety to the doctor. It may mean so little or so much. It may be due to nothing worse than an attack of acute indigestion, set up by a *green* apple; or it may indicate an attack of acute peritonitis set up by a *green* and gangrenous appendix. It is a matter, therefore, which craves wary walking in diagnosis."

O, stay me not, the Muse hath cast
Her spell upon me, for at last
I find the cause of belly pain
Is varied—that at least is plain.

Now, children's tummies oft contain
The elemental seeds of pain;
For *apples green*, so hard and sour,
Cause ructions there at midnight hour

But these can eas'ly be allayed
By Castor Oil, a bribe being paid
Of cash, or jam, or trivial toy;
Don't let *green apples* you annoy.

A young appendix, green with age
Of suppuration's latest stage,
'Tis *gangrene green*,—Oh, dearie me,
Here's something worth a largish fee.

VACANCIES.

NOTIFICATIONS of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 33, 34, 35, 38, 39, and 40 of our advertisement columns, and advertisements as to partnerships, assistantships, and locum tenencies at pages 36, 37, and 38.

THE appointments of certifying factory surgeons at Finedon (Northampton) and Purfleet (Essex) are vacant.

SCALE OF CHARGES FOR ADVERTISEMENTS IN THE BRITISH MEDICAL JOURNAL.

	£	s.	d.
Six lines and under	0	9	0
Each additional line	0	1	6
Whole single column (three columns to page)	7	10	0
Half single column	3	15	0
Half page	10	0	0
Whole page	20	0	0

An average line contains six words.

All remittances by Post Office Orders must be made payable to the British Medical Association at the General Post Office, London. No responsibility will be accepted for any such remittance not so safeguarded.

Advertisements should be delivered, addressed to the Manager, 429, Strand, London, not later than the first post on Tuesday morning preceding publication, and, if not paid for at the time, should be accompanied by a reference.

NOTE.—It is against the rules of the Post Office to receive *poste restante* letters addressed either in initials or numbers.